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THE PRESENT CONSIDERATION AND CARE OF THE COLON *

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CLIFTON SPRINGS, N. Y.

It is my purpose in this contribution to call attention more specifically to those functional disturbances of the large bowel which are frequently the cause of considerable concern to the patient, and annoyance to the attending physician. It is not my purpose, on the other hand, to discuss chronic ulcerative colitis. That condition is at present receiving intensive study, especially in the bacteriologic laboratory, and a voluminous, controversial literature is about the only definite result as yet.

Among the functional disturbances of the bowels are certain irregularities due to an atonic condition at times or, again, to a spastic condition of the colon. With these disturbances of motility there are also secondary disturbances, and these together may gradually develop a mild irritative condition of the mucous membrane, with a production of stringy mucus, ordinarily called mucous colitis, and attributed to a neurogenic origin. There may gradually develop a more or less catarrhal condition with a production of flakes or clumps and strings of mucus containing innumerable leukocytes. Others of these functional disturbances are dilatation and sagging of certain portions of the colon, due either to congenital defects or to developmental changes. On account of the attempt at a compensatory restoration of function, extraperitoneal folds are formed. Also on account of continual traumatic insult there may develop weblike adhesions.

With all these disturbances which may take place in or about the colon, the patient almost invariably develops a certain degree of invalidism characterized by psychic and neurotic symptoms. Other symptoms more constant and probably more significant are irregularity of the bowels, such as constipation and occasionally diarrhea, an accumulation of gas in the abdomen, producing an annoying borborygmus, irritation and soreness in the course of the colon, and an occasional pain and bearing down sensation, especially in the lower part of the abdomen. The pain may be very severe, especially before there is a stool, usually consisting mostly of mucus. The pain may occur suddenly and be cramplike in character, mimicking acute appendicitis, gallstone attacks, renal colic or duodenal ulcer.

Such misleading symptoms demand careful consideration, as occasionally unnecessary operative procedure is undertaken. The patient gradually develops a food phobia and subjects himself to an unnecessarily rigid diet. This leads to loss of weight, which in turn aggravates the original condition, forming a so-called vicious circle. It is not unusual for the patient to become bedfast.

The problems which such a case present are numerous. Not the least among these is that of a differential diagnosis. The case study must be complete. It is an unfortunate mistake to proceed with a long course of treatment—and it usually is a long one—on the assumption that the condition is only an intestinal neurosis, and find later that a serious organic lesion has been overlooked; but it is even more unfortunate to take up surgical intervention with no organic lesion warranting an operation. The chief concern, therefore, in the consideration and care of the colon is that the diagnosis will represent the real condition present and will suggest the course of treatment. There is probably no diagnostic procedure more helpful in determining the true condition of the colon than the roentgen examination. It shows the position of the colon and whether it is free or fixed. With the judicious use of belladonna or some of its derivatives, and by repeated gastrointestinal series and barium enemas, the roentgenogram reveals, among other things, the abnormally spastic or atonic colon and excludes organic changes.

Before undertaking the treatment of these patients with chronic disturbance of the colon, one should obtain a certain concept of the state of the nervous system. This is accomplished largely through a painstaking, careful history. Also the disturbances of the secretory activities of the alimentary tract should be known. Such information as is obtained from gastric analysis, duodenal drainage and examinations of the stools is helpful. It is desirable to make all these studies in a definite and concise order before the treatment is planned. Uncertainty on the part of the physician will soon lead to an unfortunate psychologic reaction on the part of the patient. Every effort should be made to overcome anxiety and nervous strain. The diet should be nutritious so as to maintain a normal, or somewhat higher than normal, body weight for a time. The diet should not be bulky, coarse and irritative when the case is first undertaken. In the early stage of the treatment it is well to purée the vegetables and stew the fruits. Abundance of fat in the way of butter, cream and olive oil should be given. Irritating cathartics should be avoided; they are not necessary if fats and fluids are given in sufficient quantities. If medication is necessary, on account of constipation, it should be determined largely by the degree of spasticity of the bowels and the acid content of the gastric juice. Constipation with a spastic bowel and a high gastric acidity yields more readily to an alkaline laxative, such as magnesium oxide with the addition of belladonna or its

* Read before the Section on Gastro-Enterology and Proctology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930.

derivatives, whereas the atonic bowel with low gastric acidity will yield more readily to bitter laxatives, such as the cascara preparations with the addition of nux vomica and its derivatives. As the symptoms of the irritable colon disappear the diet should be changed by allowing more roughage and a more even balance of carbohydrates and fats. This will usually control the irregularity of the bowels that gives such concern. Frequently patients with an irritable or a sluggish colon will resort to large and repeated enemas.

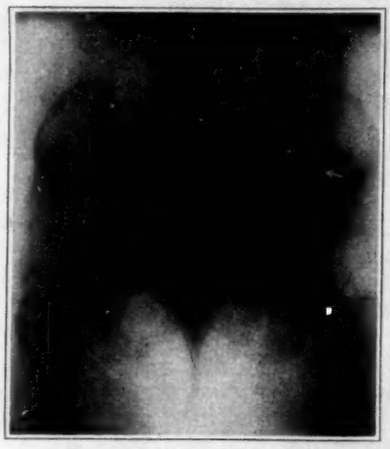

Fig. 1.—Barium enema entering colon.

It is unfortunate for these patients to get into the habit of flushing the colon, as is so often the case. This procedure has become a kind of fetish, and it seems to have come to such a pass that in any representative community the citizenship may readily be divided into two distinct groups—those who wash their colons regularly, and those who do not. It might be well for the medical profession to determine what of good there is in this procedure and to protect the laity against certain fatiguing, unnecessary and expensive manipulations.

In a reply to a follow-up letter, recently received, this report is given: "Extensive internal irrigations have been used since my return home. I am not clear that they did me a great deal of good, though it seems a very rational and practical thing." The idea prevails, especially among the laity, and among some physicians, that the colon is a constant source of danger because of a supposed possibility of infection from pathogenic microorganism, or from absorption of toxic poisoning, and it must therefore be responsible for many human ills. For this reason the colon has become the field of exploitation and experimentation to an amazing degree. No more radical measure in medicine has been offered than that of some two decades ago, when Sir Arbuthnot Lane advocated the total excision of the colon in certain abdominal disorders, among which were chronic colitis with adhesions of the colon. Fortunately, the profession did not long follow this procedure. Partial colectomy came next with multiple short circuitings; and finally, it seems, colonic lavage became the vogue. This is a procedure which has been known for centuries but it comes this time with an intricate technic, requiring complicated armamentarium. Consequently, there are at present doctors, nurses and attendants who permit themselves to be designated as colon specialists. It is not unusual to find under the plate glass of the dresser in a hotel room a card on which these colon experts announce their willingness to lavage the colon before the guest retires. The degree of their efficiency is usually measured by the distance these specialists can thread the colon with a suitable tube, the amount of fluid they can introduce, and perhaps the size of the fee they exact.

But ours is not the only generation responsible for such exploitation of the colon. In an address given by Dr. Arthur F. Hurst [1] before the Harrogate Medical Society, England, Nov. 26, 1921, entitled "The Sins and Sorrows of the Colon," he says: "Pliny A. D., 77, tells how the Egyptians learned to wash their bowels from observing the habits of the ibis. He washed the inside of his body by introducing water with his beak into the channel by which our health demands that the residue of our food should leave. It is cruel to deprive the ibis of his claim to this epoch-making discovery, but the truth must be told; the ibis does not give himself a colonic douche, but after washing his beak in water he oils it in his preen-gland, which is situated near the anus, in preparation for preening his feathers." In the sixteenth century the enema reached the height of its popularity. It is recorded that Louis XIV received several thousand intestinal douches in the course of his life and that the pious Duchess of Alva treated her sorely ill son with enemas, an emulsion of religious relics, but unhappily they failed to save him.

There is no doubt that in certain conditions a simple enema of warm salt solution, or one containing certain medication, is indicated and, when properly given, is a valuable therapeutic measure, but my contention is that it is given undue importance at times, and at times may do great harm because of grave pathologic conditions and unnecessary manipulation. Any fluid, even though it has the consistency of the ordinary barium enema, after it once passes the anal sphincter, will pass easily up the sigmoid and descending colon, across and down to the caecum regardless of the position of the body of the patient. This is easily demonstrated as shown with the roentgenograms taken by Dr. C. Harvey Jewett, of our staff, in which he scheduled the rate in minutes of a barium enema as it transversed the colon from the anus to the cecum, using a small, hard rubber anal tip, according to Hurst's suggestion, which delivered the enema just inside the anal sphincter.

Another film will show the position of an ordinary, so-called colon tube when the attempt is made to insert it at the anus and pass it through the course of the large bowel. It is true that, with proper manipulation, a soft rubber tube may be passed through the sigmoid and probably to the splenic flexure, but what is to be accomplished by such a procedure? If the fluid goes up to the ileocecal valve and beyond it, without the distressing manipulation, what is to be gained by attempting to thread the colon? Some of the colon enthusiasts maintain that certain vaccines or microorganisms cannot be "planted into the cecum except by being delivered through a rubber colon tube properly placed." It is my impression that any vaccine broth with no heavier consistency that that of an enema of liquid petrolatum or barium sulphate can be passed into the cecum with ease, just as soon as the tip of the syringe nozzle is placed inside the anus. For these

Fig. 2.—Barium enema after one minute.

1. Hurst, A. F.: Brit. M. J. 1:941 (June 17) 1922.

reasons and others I feel that the attempted vaccine "implantations" are an unnecessary hardship to the patient. I am also convinced that in certain cases the irritation subsequent to the manipulation of the tube in the rectum and lower sigmoid, together with the distention brought about by quarts and sometimes gallons of water, may do harm.

In a paper presented by Drs. Friedenwald and Feldman before the American Gastro-Enterological Association at Atlantic City, last May, they concluded from experiments on animals that the prolonged use of even the simplest form of enema proved slightly irritating to the bowel. However, oil showed no effect. Weak solutions of chemicals of different forms produced changes ranging from slight inflammation to ulceration. They also reported a tendency to a thinning of the intestinal wall and a loss of elasticity. Figure 8 shows the pathologic changes in a descending colon removed at autopsy from a patient who had an ulcerative and hemorrhagic colitis. If we had succeeded in distending this colon in a flushing process, as suggested, we would, without doubt, have produced a perforation long before it occurred.

Fig. 3.—Barium enema after one and a half minutes.

The intestinal flora may be readily modified or changed by alteration of diet. A low carbohydrate diet for a few weeks, or, again, a low protein diet for the same length of time, may result in a more definite change in the intestinal flora, when such a change is indicated, than the feeding of certain micro-organisms, or the administering of daily cathartics, or the extensive colonic flushings occasionally advocated.

It is encouraging to have this opinion corroborated by so able an authority as Dr. Arthur F. Hurst, physician to Guy's Hospital, already quoted, who says, in addition: "It is of great importance that the douche should be properly instituted. Nurses are always taught to pass the tube as far into the rectum as possible, and are rarely satisfied unless 12 or more inches have been introduced. Until comparatively recently, I understand, this was the general practice, but the pelvic rectal flexure, where the freely movable pelvic colon joins the fixed rectum at an acute angle, is 4½ inches from the anus, and it is a physical impossibility to pass a rubber tube beyond the flexure excepting through a sigmoidoscope which has been manipulated through the flexure. This was proved long ago by surgeon Goodhart, in the postmortem room in 1900, and again more recently I demonstrated the same fact with the x-ray, which show that the tube turns back when the flexure is reached and curls up in the rectum." This experience coincides exactly with our own as demonstrated by a roentgenogram taken with the colon tube carefully inserted, supposedly to the extent of the entire length of the colon.

The teaching in medical schools and in training schools for nurses with reference to giving enemas should be more specific than it appears to be. It should be taught that the difference between an ordinary enema and the so-called high enema is not determined by the length of the rubber tubing passed through the anus but by the amount of fluid used and the length of time allowed for it to flow in and out.

It might be said that the natural condition of the colon is to be more or less full, and any attempt to keep it empty by strong laxatives or large enemas or flushings is based on a misconception of the function of the colon and will be likely to cause harm. The colon should have the same consideration and care in relation to disease as any of the other viscera and should not receive any more abuse than any other organ when there seems to be a dysfunction.

ABSTRACT OF DISCUSSION

DR. SARA M. JORDAN, Boston: Dr. Lichty spoke of the difficulty of diagnosis of colonic functional disease. The difficulty is great. In one point I would differ with him. He said that he thought it was a little more unfortunate to operate for a surgical lesion and find none than to carry on a long medical treatment for colonic functional disease and then discover a serious organic lesion. I have been so trained by my surgical associates, medical-minded as they are, that I find myself more chagrined to have carried on the long medical procedure in the presence of a serious organic lesion requiring surgery than to have had a patient operated on when no organic lesion was found and then to have carried on the medical procedure for a functional disease. The symptoms of colonic functional disease mask and induce and increase symptoms of organic disease. I have in the past year collected a small group of cases in which the symptoms of diaphragmatic hernia were undoubtedly induced by functional colonic disease. They showed a definite, large hernia which could be kept symptom free if treatment of the colon and a mild hyperchlorhydria were carried out. They were not good surgical risks and could not be operated on, but if the colon was not distended and functioned normally those patients had no symptoms from the diaphragmatic hernia. The pernicious and the baneful effect of colonic irrigations cannot be stressed too much. In the first place, it is an unnecessary intervention and the trend of modern therapy in other conditions, such as in heart disease, has been against and away from unnecessary intervention. Secondly, the loss of body fluids which must occur with colonic irrigations or with any forced stimulation of the colon is, I believe, an important consideration. It has recently been shown how important the loss of gastric and pancreatic secretion is; to a lesser degree I think the loss of fluid from the colon which follows colonic irrigation should likewise be an important consideration in the discussion of this form of therapy. The distention and loss of tone that must occur from colonic irrigations, and does occur as we have observed in cases referred to us, is also a serious consideration and should be used as an argument against this vogue.

Fig. 4.—Barium enema after two and a half minutes.

DR. JOHN G. MATEER, Detroit: I am heartily in accord with everything Dr. Lichty has said. As to the differential diagnosis of these functional colon conditions, I think it will be agreed that there are still too many so-called chronically inflamed appendixes and relatively thin-walled, noncalculous

gallbladders being removed, because colon distress is attributed to pathologic changes of the gallbladder or appendix. This error could be materially reduced if further emphasis were placed on the characteristic clinical picture of the irritable colon. Time does not allow a development and illustration of this point. As regards treatment, extremely satisfactory therapeutic results can be obtained in a high percentage of these irritable colon cases, provided the diagnostic analysis is complete and the therapeutic program is correspondingly comprehensive, and provided, finally, that the cooperation of the patient is obtained. In my experience, the most important single point in the successful treatment of these patients consists of a painstaking analysis of the patient's nervous status, followed by the elimination of those faulty habits which tend to increase the general nervous irritability, which, in turn, is reflected out through the autonomic nervous system to the wall of the alimentary tract. In this connection it is absolutely essential to eliminate such habits as hurry, overwork, worry, the so-called anxiety state, the use of external stimulants, such as coffee and tobacco particularly, abnormalities in the sex life, which in certain women patients constitute an important factor in maintaining the nervous tension, and other similar habits. Dr. Lichty has simplified the discussion of diet in these cases, and properly so, because so many of these patients come to the physician with an elaborate, fixed idea about some diet fad, which has to be eliminated. I am heartily in accord, also, with his criticism of the indiscriminate use of colonic irrigations. As to drug therapy in these patients, of feces. Secondly, it requires a long time to give a colonic irrigation. It is not a matter of getting water to the cecum and out again; any enema will do that. That is why an enema may be a bad thing. The colon should never ordinarily be emptied so completely as that, and that is an objection to frequent irrigations. Irrigation of the colon must be done slowly. I use the two-tube method because I don't want the colon overdistended. We go about it very slowly, placing the bag so that there is a level of the water of about a foot and a half or two feet above the patient to make very low pressure. It takes me from three quarters of an hour to an hour. Are these colonic irrigations of any use? Yes. Sometimes after a lot of soaking I get out nasty mucus. I have bottles of preserved mucus and great casts of the intestine up to 18 inches in length, dark colored and vile-smelling when expelled; and this does not come down at first, and it rarely appears in the feces so far as I can see. If these mucous substances never appear in the feces, what becomes of them? They must be absorbed into the system and they are poisons. But I would sound a warning: irrigations should not be abused. Using them every day is a serious mistake.

DR. L. J. HIRSCHMAN, Detroit: I agree most heartily with the warning Dr. Lichty has uttered about the chain store system and the corner cleansing stations for the colon. It has come to a point where standardization has been carried a little bit too far. He stated that a complete roentgen examination is made, but he did not specify that, besides the making of serial plates,

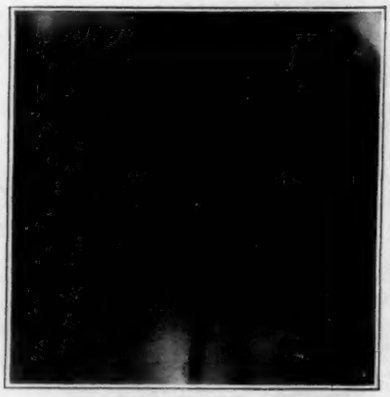

Fig. 5.—Introduction of a colon tube supposed to have passed to the cecum.

Fig. 6.—Barium passes through the tube shown in figure 5.

Fig. 7.—Barium enema administered through an ordinary anal nozzle in a patient with redundant sigmoid loop.

I have found that small doses of phenobarbital and the time-honored remedy, belladonna, are particularly helpful in the early therapy. I should like to emphasize the fact that, although there is probably no medical condition confronting the physician which requires greater patience than the handling of some of the more difficult cases, nevertheless the therapeutic results more than justify the time and effort expended.

DR. WALTER A. BASTEDO, New York: A barium enema does not represent the normal state of the colon; it represents the effect of an enema on the colon, with extreme distention, a condition in which the colon is not ordinarily found at all. Haustral contractions are not peristaltic waves, though often thought to be so by those interpreting them. Haustral contractions may last a half hour or an hour. I have seen them last a long time in an animal with its abdomen opened. They are retarding contractions of the colon. They keep back the contents of the colon. They prevent movements all the time as the material comes down from the ileum into the colon; therefore, they are not peristaltic waves at all. They are fixed, spastic waves. On the other hand, peristaltic waves are driving waves and in the roentgenograms are distinct from these. I agree absolutely with Dr. Lichty about colonic irrigations. I am an advocate of colonic irrigations because they do something, just as I am an advocate of lavage of the stomach in the proper place. Colonic irrigations are not usually given well. In the first place, the patient must have had the morning movement or an enema should be given to produce the movement, because a colon cannot be properly irrigated if the lower bowel is full he includes a careful fluoroscopic investigation with the patient turned from side to side, not only after a meal but also after a sufficient injection of barium into the bowel to outline it without the distention about which Dr. Bastedo properly utters a warning note. He is right that a barium enema represents a distended colon and not a normal one. However, often one must inject enough barium from below to get a complete filling, so that on manipulation one can discover whether there are any filling defects which are on a different plane from the anterior-posterior, through which plane most roentgenograms are made. Most of the patients who come to the physician suffering from colonic dysfunction are women, and a large majority of those women have had, at some time, an abdominal operation, and most of those women have been operated on by physicians under general anesthesia when, in order to have a clear field, whether the patient was in a Trendelenburg position or not, quantities of gauze were used to "pack off" the intestine. If any one thing insults the delicate serous membrane, it is rubbing it, straining it, pushing it with gauze, whether it is rough, wet or dry, and many women who suffer from colonic dysfunction improperly interpreted and call on the colonic laundries for assistance without getting good medical advice are not suffering so much from integral disease of the bowel wall as from abnormal irritation from some insult offered by a well meaning surgeon in the course of an abdominal operation. I am a surgeon myself. I feel that the gauze should be protected with rubber dam and a spinal anesthesia used so that the bowel lies where it is put, and then some of our friends will not have so many cases of

colonic dysfunction. The male patients and many female patients, who have not enjoyed the luxury of an abdominal operation, owe their cases of colonic dysfunction to legislative enactment. Since the Eighteenth Amendment has come into force, many people who, previous to that time, did not feel the need of alcoholic stimulation now believe that "forbidden fruits taste sweetest" and are now "making their own." As a result of the irritating quality of alcoholic fluid sent into the colon, they not only have their digestion impaired but their colons are irritated, and many cases of disturbed colon or colitis seem to occur.

DR. JULIUS FRIEDENWALD, Baltimore: We have been trying to discover the effect of colonic enemas and irrigations on animals and we have carried out at our clinic at the University of Maryland some experiments in which we have studied the colons in dogs that have been subjected to enemas over long periods. We have noted that the continued use of enemas is harmful to the bowel and is likely to induce a variety of colonic disturbances ranging from a mild to a more or less severe type. Water, oil and acriflavine hydrochloride (1:3,000) produce less irritation, and soapsuds and chemicals, even in weaker solutions, may cause extensive ulceration.

Fig. 8.—Descending colon recovered in a case of hemorrhagic colitis with perforation.

DR. SEALE HARRIS, Birmingham, Ala.: The most important thing in the treatment of most colonic conditions is to let the colon alone and treat the patient. Much harm has been done by continuing smooth diets too long. Regarding the etiology of this condition, I think it is important to consider the vitamins, about which some people say nothing is known; but there is a great deal that is known about vitamins. Usually the people who say nothing is known about vitamins are those who really do not know anything about them. Sugar saturated, vitamin starved Americans, living on white flour bread, white rice, white potatoes, lean meats, oleomargarine butter and sugar saturated desserts and soft drinks, are prone to develop disturbances of the colon. Most persons live on such a deficient vitamin diet, and as a result they have intestinal infections of all kinds. I agree with Dr. Hirschman that, if people could be taught to forget bran, they would be a lot better off in these cases, though I think it is not the smooth diet that is needed so much as a well balanced diet, one rich in vitamins, consisting largely of fruits and vegetables, milk, cream and butter, and meat once a day. Cut out the sugars entirely and reduce the bread: in other words, a low carbohydrate, rich vitamin diet. It is also important to teach the patient with disturbances of the colon how to live, work eight hours a day, not too much, but work enough, with eight or nine hours in bed at night and a rest at noon. As Dr. Weir Mitchell has said, the best doctors of all times have been those who regulated the lives of their patients so that they could be restored to health and maintain health afterward.

DR. JOHN A. LICHTY, Clifton Springs, N. Y.: The main object of the paper was to call attention to the rather intensive irrigation of the colon which is done in a somewhat promiscuous way for conditions in which the colon has no part. I am indebted to Dr. Friedenwald for referring to his recent paper, read at Atlantic City, in which the results of long continued, and large irrigations of the colon of the dog are reported. It seems that an irritation of the mucous membrane and loss of tone of the colon resulted. The conclusion is that such irrigations of the human colon may do more harm than good. With reference to Dr. Jordan's remarks, I would say that while the chagrin to the physician may be great when the pathologic condition in the abdominal cavity that warrants operative procedure is overlooked, it does not compare, sometimes, with the pain and suffering which these patients endure who have repeated laparotomies followed by extensive adhesions. With reference to the difficulty in interpreting the real condition of the colon with the barium enema to which Dr. Bastedo has called attention, one must take a conservative attitude in drawing conclusions from the test. The patient should have repeated barium enemas under different conditions; at one time after being under the influence of belladonna to the physiologic limit and again without belladonna. The "vile stuff" in the colon to which he refers is the normal or usual content of the colon; but, unfortunately, nature has so provided that this is not necessarily absorbed from the bowel and does not need to be washed out to the extent of 95 per cent to insure health and well being. There are conditions in which the colon should be emptied by lavaging, but it should be done under careful supervision, with a nurse or an attendant, if desirable; but the enthusiasm for washing until the last remnant of feces or the last bit of mucus disappears should be guarded against. It may be dangerously fatiguing in certain cases. The difficulty of furnishing the colon patient with sufficient vitamins, as suggested by Dr. Seale Harris, should not be an insurmountable one, so long as the green vegetables and fruits can be puréed.

SPONTANEOUS PNEUMOTHORAX *

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AND
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CHARLESTON, S. C.

Spontaneous pneumothorax is a term that is generally used to indicate the presence of air in the pleural cavity from any internal cause. Some writers, however, consider as spontaneous only those cases in which there is no associated pathologic change of the lung (the so-called idiopathic pneumothorax). In this paper we shall consider those occurring from any internal cause.

Spontaneous pneumothorax, taken as a whole, is not an uncommon occurrence. However, the so-called idiopathic pneumothorax is rare, there having been only about seventy cases reported, and in no instance was there a report of more than four cases by any one man. There are five case reports included in this paper of patients in whom no pathologic change of the lung was demonstrable nor any history of previous lung trouble, and the subsequent history shows them to be normal in health. One other case gave no history of previous lung trouble and the normal side at the time of examination showed no evidence of disease. However, we were unable to repeat the examination after the collapsed lung had resumed its normal state. All of these are therefore considered to be definite idiopathic cases.

The most common etiologic factor responsible for the development of this condition is tuberculosis. The records show that this is the cause in about 80 to 90 per cent of the adult cases and 40 to 50 per cent of the cases in children. The difference here is due to the fact that there are more cases in children that are

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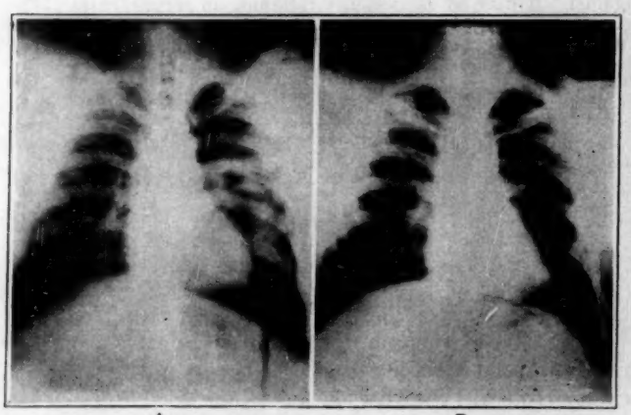
caused by the acute infectious diseases. Among the other underlying causes are empyema, gangrene, bronchiectasis, infarct, pneumonia, emphysema, new growths and very rarely the action of gas forming bacteria in a pleural exudate.

As the name implies, no cause is known for the idiopathic group. However, there are various ideas put forth as to the cause. Some state that these cases are probably due to a tuberculous infection in which there are no physical signs obtainable and no positive roentgen evidence is obtainable. The theory has also been advanced that a tuberculous process is present and causes the rupture and that the collapse and rest of the lung allow this process to heal entirely without leaving any scar formation. Others think the condition due to the rupture of an emphysematous bleb on the margin of the lung. Still others think that probably there has been some inflammatory condition causing adhesions between the visceral and parietal pleuras and that unusual exertion causes this adhesion to be torn loose, thus causing a rupture. This type of case rarely ends fatally, and it will be difficult ever to establish a real cause.

The exciting causes are coughing, sneezing, laughing, vomiting, hiccups or muscular strain; or there may not



A B

Fig. 1 (case 1).—Appearance of chest: *A*, twenty-four hours after onset, showing complete collapse of the left lung but very little displacement of the mediastinum. *B*, four weeks after attack: normal.

be an exciting cause. The condition often occurs while the patient is at rest or even asleep.

If the condition occurs as the result of a preexisting tuberculosis or other inflammatory disease, the onset may be insidious and the patient may not know when it happens. This is due to the presence of adhesions and to the fact that the lung cannot collapse suddenly or completely. On the other hand, if there are no adhesions the onset is sudden and there is a sharp, stabbing pain in the chest followed immediately by a feeling of suffocation, air hunger and a feeling of impending death. There is usually a marked cyanosis and often collapse. There is also a marked orthopnea and the patients cannot lie down until the acute stage is passed. When able to lie down they usually lie on the unaffected side. There may be a distressing cough, but this is not a constant symptom.

After the first twelve to twenty-four hours the character of the pain changes to a dull pressure sensation, which the patients describe as a heavy weight on the chest. They become more comfortable, the dyspnea becomes less marked, and unless complicated by fluid there are no symptoms after a few days.

If seen early, the patient is cyanotic and there is an expression of extreme anxiety. The alae of the nose are dilated and the effort to breathe is noted. The respirations are shallow, rapid and forced, and the accessory muscles of respiration are brought into play.

On examination the following signs are usually found: The affected side is larger than the unaffected. The intercostal spaces are pushed outward. There is little or no motion on respiration. The cardiac impulse may be seen to be displaced. There is diminished or absent fremitus. The cardiac impulse is felt and is displaced away from the affected side.

The percussion note is tympanitic and the tympanitic area is larger than the normal lung. The percussion note may change when the patient opens and closes his mouth, owing to the free communication of the intrathoracic air with the outside air. The cardiac dulness is displaced or in some cases cannot be elicited. If fluid is present there is a corresponding area of dulness, which changes completely with a change of position.

The breath sounds are suppressed or entirely absent. If they are present, breathing is amphoric in type. Voice sounds are also diminished or absent. A succussion sound is often heard even when there is no evidence of any fluid present. The coin sound is a nearly constant sign and is one of the most significant.

The roentgen examination should be made by both fluoroscope and film. The upright position is the most satisfactory, as it is easier in this position to determine the presence and amount of fluid. The appearance will vary according to the degree of collapse. The air shows as a very clear area in which there are no lung markings. If adhesions are present they show as irregularly expanded areas, held to the chest wall, and they are denser than the surrounding collapsed areas. The mediastinum is shown displaced away from the affected side. If fluid is present it shows as a dense shadow at the lower part of the chest, which changes position as that of the patient is changed. By shaking the patient one can form waves and notice them pass through this fluid. Waves are noted also as synchronous with the beats of the heart.

The duration of the disease depends on the underlying pathologic changes. The uncomplicated cases usually clear up in from two weeks to two months but may last much longer. One case is reported that lasted for sixteen months and then cleared up completely. Another case has been known to exist for twenty years.

Fluid rarely forms in the cases in which pulmonary changes cannot be demonstrated but is common in the tuberculous cases. The fluid may be, and usually is, a pleural effusion but may at times be blood from a ruptured vessel. If the fluid becomes infected, the course of the disease is greatly prolonged.

The prognosis in the tuberculous cases is grave, the mortality being about 70 per cent. In several cases of known tuberculous origin, the tuberculosis has been completely arrested by the collapse and rest of the lung.

The prognosis in the cases without demonstrable pulmonary changes is favorable; only one of the fifty-eight cases studied by Fussell and Reisman ended in death.

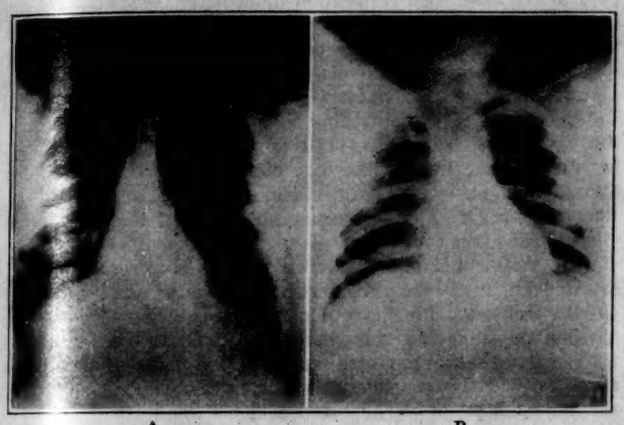
Bilateral pneumothorax is nearly always fatal and the patients die within a few hours.

Recurrence of the pneumothorax is not uncommon. One case is reported in which there were eleven recurrences. In another there were eighteen recurrences during a period of eight years, all of which were of the right lung except one.

TREATMENT

As it is necessary for the fistula to close before the lung can expand, the patient should be kept quiet, the cough should be controlled as much as possible, and deep inspirations that tend to aspirate infectious material into the pleural cavity should be avoided. This can be accomplished by strapping the side, which is the only treatment necessary in the mild cases with no fluid.

In the cases presenting a moderate amount of fluid, if the symptoms are not severe it is best to delay drawing off the fluid until the fistula has had time to close. On the other hand, when there is a large amount of fluid immediate tapping may be necessary to relieve pressure symptoms. In these cases it is best to draw off only a small amount of fluid at a time because of the danger of reopening the fistula and allowing infectious material to enter the pleural cavity.



A B

Fig. 2 (case 2).—Appearance of chest: *A*, twenty-four hours after onset. *B*, after twelve weeks: normal.

In cases in which a frank purulent exudate is present, a thoracotomy is resorted to.

In some of the cases in which the opening is valvular in type, even though no fluid is present, the intrathoracic pressure may be raised to such a degree that the pressure on the heart is dangerous. In these it may be necessary to insert a cannula and remove some of the air.

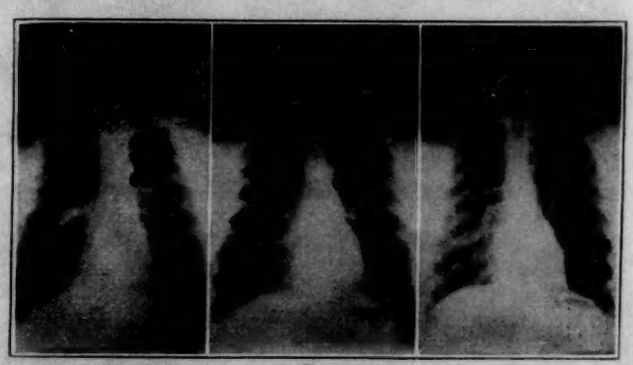
REPORT OF CASES

CASE 1.—E. M. S., a white man, aged 32, a toll-gate keeper, who had had good health, without serious illnesses, tuberculous association, influenza or pneumonia, had had an unexplained mild diarrhea about one month before, which had cleared before the present trouble. May 28, 1929, while standing with his arm resting on the side of a car and talking, he was seized with a sudden stabbing pain in the back at the angle of the left scapula, which then radiated over the whole chest. The pain was excruciating for about two hours, when it was relieved by acetylsalicylic acid. The pain was accompanied by a marked dyspnea. After the effect of the acetylsalicylic acid had worn off the pain was never severe except when the patient attempted to lie down. For about a week he was unable to lie flat without severe pain. The patient never had any cough and after a few hours the dyspnea was not marked. He made an uneventful recovery and was apparently perfectly well in four weeks. He has had no subsequent trouble.

CASE 2.—H. W. M., a white man, aged 38 or 39, a plumber, who had always had good health without lung trouble or association with tuberculosis, developed a sudden, acute pain in the lower part of the left chest, dyspnea, and profuse sweat while he was seated at the table at home, without any exertion. After a few hours the acute symptoms passed and the patient was comfortable, except on coughing or deep inspiration. A roentgenogram taken Nov. 3, 1927, the second day, revealed no fluid. He had no subsequent trouble and was back at work in about two months. The lung was not completely expanded for more than three months.

CASE 3.—A. T. C., a white man, aged 26, a clerk, had had no tuberculous association, and had always had good health except that about two years before he had had a sudden onset of acute pain in the left chest. This was thought by his physician to be pleurisy. On the second day there were signs of effusion. This rapidly increased and on the third day the left chest was filled with the effusion. The chest was tapped at this time and a small amount of fluid was removed which had the appearance of fresh blood. Two days later a large amount of fluid of the same quality was removed. No cause was ever found for this condition. In about five or six weeks the patient had fully recovered and there were no physical signs in the chest. Feb. 17, 1928, after having gone to bed feeling perfectly well, the patient was awakened by an acute pain in the lower right side and he developed a severe dyspnea. Both were less severe the next day when he reported to his physician. The physical signs were typical of a pneumothorax, and roentgen examination confirmed the diagnosis. No fluid was formed, and March 2 the lung was about one-half expanded. April 3 the lung was shown to be completely expanded and otherwise normal. There was no evidence of any pathologic change. Since then he has been back at work without any evidence of trouble. In view of this attack, it is thought probable that the previous attack was a spontaneous pneumothorax also in which there was a rupture of a vessel of considerable size, thus accounting for the large amount of blood in the pleural cavity.

CASE 4.—H. D. R., a white man, aged about 25, who worked at a filling station, had had good health, without previous lung trouble, association with tuberculosis and no recent illnesses. The patient had been drinking and had become nauseated. He was leaning against a tree in the act of vomiting when he was seized with a severe pain in the lower right side of the chest and back. He went home to bed. The pain continued and dyspnea developed. A roentgenogram the second day showed the right lung to be completely collapsed. The right chest was half full of fluid and the mediastinum was displaced to the left. There was no evidence of involvement of the left lung. The patient's chest was tapped and bloody fluid was removed; there was a slow expansion. There have been no check-up roentgenograms made since the lung has returned to normal. However, the patient, who has since left Charleston, has not reported any symptoms of lung trouble and is apparently in perfect health and continuously at work.



A B C

Fig. 3 (case 3).—Appearance of chest: *A*, Feb. 18, 1928: complete collapse of right lung and considerable displacement of the mediastinum to the left; right side of diaphragm displaced downward. *B*, March 2: right lung about one-half expanded. *C*, April 3: right lung completely expanded and normal in appearance, and mediastinum returned to normal position.

CASE 5.—A. M. S., aged 37, a clerk, who had had no recent illness, no previous lung trouble and no tuberculous association, while seated at a desk had a sudden acute pain in the right side of the chest with loss of consciousness for a few minutes. The acute pain passed after a few minutes and after taking acetylsalicylic acid, but the patient has had some pain ever since the onset (forty-eight hours). Symptoms at forty-eight hours were pain in the right side of the chest, exaggerated on deep inspiration, and marked dyspnea on exertion. Dec. 7, 1929, a

roentgenogram showed a complete collapse of the right lung. December 14, a fluoroscopic examination showed a slight expansion. December 30, fluoroscopy showed the lung to be about one-half expanded, more at the base than at the apex. There was a very small amount of fluid. Jan. 6, 1930, fluoroscopy showed a complete expansion except for a small area at the apex. The film taken January 10 showed a complete expansion. There has been no evidence of any definite pathologic changes in the lung. The patient was symptom free and there were no physical signs.

COMMENT

These cases are reported because of the unusual number in one clinic in a relatively short time; also because of the fact that although in most cases the collapse of the lung was complete, the symptoms were unusually mild and of less than the average duration.

The most unusual feature is the fact that there were two cases in which there was a massive hemorrhage

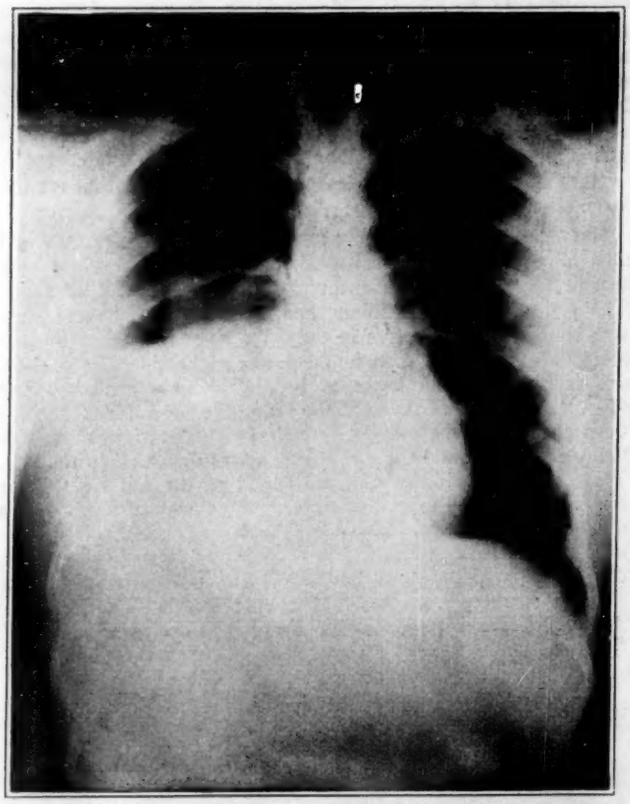


Fig. 4 (case 4).—Appearance of chest twenty-four hours after onset: right lung completely collapsed and right chest cavity about half full of fluid, which proved to be blood.

into the pleural cavity. In reviewing the literature there were no cases found in which there was an associated hemorrhage of this extent.

Riverside Infirmary.

ABSTRACT OF DISCUSSION

DR. JOHN M. BARNES, Ann Arbor, Mich.: This paper introduces an entity that may be confused with a manifestation of early tuberculosis. The diagnosis of idiopathic pneumothorax should be made only after one has exhausted all efforts to establish a cause for the pneumothorax. In the university health service and hospital we have had six cases, all of them in young white man. In one case fluid developed following the pneumothorax. There were no cases with blood. One of the cases was of the recurrent type and I think goes to show that this condition can occur without any definite infectious process in the lung. In this particular instance the man had four attacks within a year. He was followed both at Ann Arbor and at Walter Reed. In neither place was there any evidence of pulmonary disorder found. In this instance, then, we are dealing with this obscure type, which is known as idiopathic. It may be due to a bleb. The only thing in his history that was suggestive as to cause was an allergic tendency. He had hayfever but no asthmatic symptoms.

DR. W. K. LIM, Detroit: I myself have had the experience of going through pneumothorax. In my case, however, I believe it was due to a postoperative condition. I had a mastoid operation a few months previous to the spontaneous pneumothorax. I was walking one day, to take a street car, and had gone about half a block, when I suddenly experienced a peculiar sharp pain in my side. My respiration immediately became rapid and breathing short. Fortunately there were two of my friends with me and they helped me back to where I came from. My left lung was completely collapsed and my heart was displaced almost entirely to the right. Being a medical man I have had the good fortune of being able to check up the condition from the day of the occurrence until today. It took me two years to eliminate the fluid at the base of the left chest. I had films taken of it at intervals of about every six months. I am interested in Dr. Taft's paper because I want to find out just what is the exact cause of a spontaneous pneumothorax. Tuberculosis, they would say, but here I am still standing before you, seven years after the occurrence. I have in mind two other cases. One was, I believe, due to an extreme exertion. The patient was suffering from asthma. Asthmatic patients, as a rule, do not have tuberculosis. He unfortunately died of a decompensated heart. The other case was due to trauma, and the patient kept on working and held his job.

DR. R. T. WILSON, Temple, Texas: I have had the unusual experience of observing this idiopathic pneumothorax occur in both lungs in the same patient at different times. A university student about 21 years of age developed the typical stabbing pain without apparent cause, from which he recovered in about a month. Thirty-one days from the first attack he developed exactly the same type of lesion, so far as could be determined, in the other side. Every type of examination was made, even by a tuberculosis specialist. The cause has not been discovered yet. At a recent examination no evidence of the condition could be found and the patient felt that he was perfectly well.

DR. L. T. LE WALD, New York: Along the same line, I have one case in which there was a bilateral pneumothorax of this spontaneous type, in which collapse on the left side followed within a week after collapse of the right side. There is a question in that particular case whether air may or may not have gone across the mediastinal septum. Some experimental work on dogs has shown that it is possible for a communication to exist between the two sides through the mediastinum; that is, colored fluid put in one side of the chest appears on the opposite side within a few hours. In my case, the young man who had a bilateral spontaneous pneumothorax fortunately did not have a complete collapse such as occurs in some cases, but a partial collapse, and a week later showed just above the same amount of collapse on the opposite side. He made a complete recovery and has shown no evidence of tuberculosis. The other point I wish to stress is that some patients are slow in recovering the expansion of the lung. I have one case in which expansion has not occurred after a number of years. In one case expansion occurred just about as hope had been given up, about a year afterward. In that case aspiration of air was done two or three times and the patient was directed to cause some increased pressure by blowing water from one bottle to another, and finally complete expansion occurred and he has had no signs of tuberculosis or any recurrence of collapse. I had one other case recently in which there was collapse on one side and after recovery there was collapse on the other side. The point that I think ought to be stressed particularly from the roentgenologic standpoint is that there is this type which is not associated with tuberculosis. I think it is unfortunate if that is not stressed, because a patient who suffers from this condition, if it is not definitely told him, will think it resulted from some serious trouble with his lungs, particularly tuberculosis. I think that is a grave mistake. I have seen about twenty-five cases, and I have seen also a number of cases complicating tuberculosis. I have seen it also occur on both sides in tuberculosis. In the twenty-five nontuberculous cases, the only complication has been

a pleural hemorrhage in one or two, and the delayed expansion over some time, but in none of these cases—and some of them go back fully eighteen years—has there developed any tuberculosis. I have followed several of them with care roentgenographically for years.

DR. ROBERT B. TAFT, Charleston, S. C.: Another thing that I wanted to bring out is the frequency of pneumothoraces that I have seen ushering in tuberculosis. For example, a patient who seems to be absolutely healthy will develop a pneumothorax. After the lung is expanded, examination discloses a definite tuberculous lesion. A good many of those cases I have seen, I dare say six within the past three years' time. I have never seen mention in any textbook about the frequency of tuberculosis being ushered in by that.

THE PRESENT-DAY MANAGEMENT OF STONE IN THE KIDNEY*

CHARLES PIERRE MATHÉ
SAN FRANCISCO

Stone has received more attention than any other lesion of the kidney; however, certain conservative methods are retained which often result in the destruction of the kidney harboring the stone, and certain benign operations are continued which, in spite of being popularized for their simplicity and safety, favor the recurrence of stone. This paper reviews seventy-four cases of renal calculi removed by surgical intervention or cystoscopic maneuvers. Silent, quiescent, nonobstructing calculi unaccompanied by infection were untreated and are not included. The etiologic rôle of congenital deformity, stasis and infection is carefully studied and correction emphasized. The pathologic effects of stone, pyelonephritis, ulcerative necrosis, renal abscess, perinephric abscess and hydronephrosis are thoughtfully considered. These pathologic processes progressively destroy the kidney and emphasize the necessity of early recognition and removal of stone. Several cases presenting the so-called nonsurgical coral-form type of stone are reported in which fragments broke off and passed into the ureter, caused obstruction, and resulted in rupture of the kidney, abscess formation or other grave complications. Nephrotomy, pyelotomy and pyelonephrotomy are selected for the different types of stone with the purpose of conserving renal tissue and minimizing recurrence.

REPORT OF CASES

CASE 1.—J. S., a man, aged 58, a lawyer, referred by Dr. John Gallwey, entered St. Mary's Hospital, Dec. 20, 1928, because of pain and swelling in the right lumbar region accompanied by nausea and vomiting and followed by chills and fever. At 55, an impacted stone was removed from the urethra, following which he passed gravel and numerous stones. Five months later a larger stone was removed from the urethra. When the patient was 56, I performed a lithrotripsy for bladder stone. At this time roentgenograms revealed a coral-shaped stone in both kidneys and a spindle-shaped calculus in the lower left ureter. Following meatotomy and dilation of the left ureter the stone passed into the bladder and was removed by rongeur forceps. The patient was advised to have the stones in both kidneys removed by operation, but intervention was refused. From time to time fragments from the stones in the kidneys passed down the ureter and were expelled spontaneously or removed from the bladder through the operative cystoscope. Urine examination revealed masses of leukocytes and erythrocytes, albumin and myriads of colon bacilli and staphylococci. A phenolsulphonphthalein intramuscular test resulted in the return of 15 per cent in two hours. Examination of the blood revealed hemoglobin 41 per cent, erythrocytes 3,142,000, and leukocytes 27,300; 1.1 mg. of creatinine was recovered in 100 cc. of blood. Roentgenograms revealed a large right kidney, obscuration of the psoas shadow and a calculus in the region of the ureteropelvic junction. The catheter could not be passed by this impacted calculus.

Jan. 21, 1928, a transfusion was made.

January 23, the kidney was attacked through a lumbar incision and when the renal loge was opened 1,000 cc. of thick pus was liberated from a perinephric abscess which had caused compression on the liver and diaphragm. A firmly impacted stone measuring 2.5 by 1 cm. was removed by a pyelotomy incision. A number of cortical abscesses were found in the kidney. Because of the severity of the infection and the extreme debility of the patient, the kidney was not removed. Following this procedure the patient greatly improved, but the wound continued to drain pus. He left the hospital, February 21; the leukocyte count had dropped to 12,400 and he felt stronger. About two months later the infectious process present in the right kidney underwent considerable necrosis and invaded the lung. Mercurochrome-220 soluble injected into the lumbar sinus would immediately be coughed up by the patient. The renal function progressively lowered and on Christmas, 1928, the patient developed influenzal pneumonia and died.

This case exemplifies the constant danger of the type of coral-shaped stone in which fragments break away and obstruct the ureter. The fragment that obstructed the ureteropelvic junction on the right side blocked drainage, causing acute backpressure in the kidney and extension of infection which had existed in the pelvis for years, into the cortex, resulting in multiple abscesses of the kidney and a huge perinephric abscess. At the time of operation, the patient's condition only permitted drainage and removal of the obstructing stone in the pelvis.

CASE 2.—B. K., a woman, aged 68, a housewife, referred by Dr. J. H. D. Roger, entered St. Mary's Hospital, April 14, 1925, because of pain in the region of both kidneys, frequency of urination, impaired heart action and extreme debility. For the past few years the patient had passed a number of stones and experienced frequency, dysuria, hematuria, bilateral dull lumbar pain and the passage of foul smelling urine. Phenolsulphonphthalein, 5 per cent, was recovered in two hours after intramuscular injection. Blood examination revealed hemoglobin, 70 per cent; erythrocytes, 4,168,000; leukocytes, 42,250. The urine contained albumin, masses of leukocytes and erythrocytes and swarms of bacteria. Roentgenograms revealed stones in both kidneys which were considerably enlarged, also a stone in the region of the lower portion of the right ureter. As the patient was in a precomatose condition eliminating practically no urine, immediate drainage was advised and refused. The patient developed complete suppression of urine, went into uremia, and died a week later.

Necropsy revealed a left pyonephrotic kidney presenting numerous abscesses. A number of stones were found in this kidney; one was tightly impacted in the ureteropelvic junction obstructing the outflow of urine. The right kidney showed acute hydronephrosis, the obstruction being a stone in the lower ureter. One may assume that if the stone had been removed from the lower right ureter when the patient was first seen the relief of obstruction might have allowed the renal function to return in the kidney presenting rather early hydronephrotic changes. Infection in the right kidney had ended in entirely destroying this organ and nothing could have been done except radical removal.

CASE 3.—H. T., a man, aged 45, a former middle-weight prize fighter, entered St. Mary's Hospital, Feb. 11, 1924, complaining of pain and swelling in the region of the right kidney, the passage of gravel, hematuria, dysuria, edema of the eyelids, loss of weight and weakness. At the age of 43 a number of calculi passed from the right ureter following cystoscopic

* From the Department of Urology, Saint Mary's Hospital.
* Read before the Section on Urology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930.

maneuvers consisting of meatotomy of the ureteral orifice and progressive dilation of the ureter with bougies. In performing the phenolsulphonphthalein test, 50 per cent was recovered in two hours after intramuscular injection. A roentgenogram revealed a calculus in the left kidney pelvis, an impacted stone in the right lower ureter, bilateral pyelonephritis and hydro-ureter and hydronephrosis on the right side. One-half hour after intravenous injection, 12.5 per cent phenolsulphonphthalein was recovered from the right ureter and 5 per cent from the left ureter. Operation was advised, it being my purpose to remove the calculus from the left kidney, in which the infection was less than in its fellow. Operation was refused and subsequent examination, October 6, revealed a calculus forming in the right kidney pelvis. Bilateral meatotomy and renal lavages were performed and progressive dilation of the ureters was made, following which the patient passed dozens of stones from the right kidney, the largest of which measured 1 cm. in diameter. October 21, a piece of one of the stones (which had rapidly increased in size and number in the right kidney) passed down the ureter and completely obstructed it. The patient presented a huge swelling in the kidney region, had a high fever, and was toxic. In spite of the drainage of pure pus obtained by passing two number 6 Charrière ureteral catheters beyond the obstructing stone, the patient became more toxic and progressively weaker. September 26, a nephrectomy

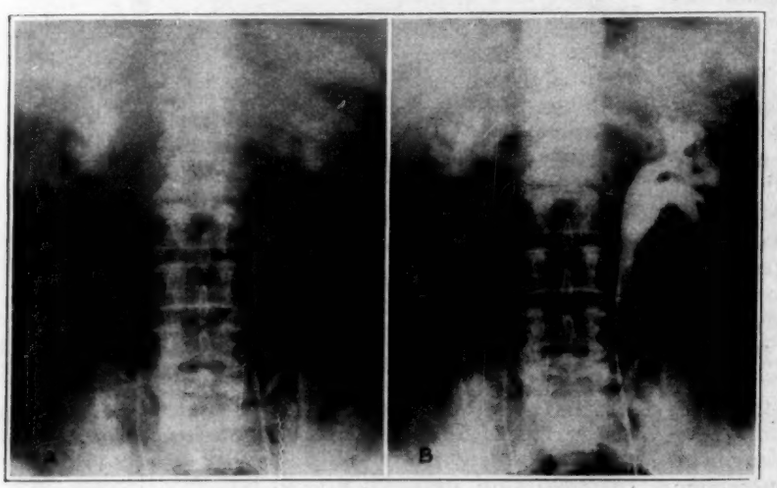


Fig. 1 (case 1).—*A*, coral-shaped fragmenting stones in both kidneys in a man aged 58, accompanied by infection. *B*, ureteropyelogram locating calculus and showing early hydronephrosis. Operation was advised and refused. Obstruction caused by a fragment lodging in the right ureteropelvic juncture resulted in an abscess of the kidney, perinephric abscess and lung fistula. Surgical removal of the calculus and drainage of the abscess were done, with amelioration of symptoms. The patient died a year later of pneumonia.

was performed and a large pyonephrotic kidney containing numerous calculi, the largest 5 cm. in diameter, were removed. The ureteral calculus was grasped by long forceps and removed through an opening high up in the ureter. The convalescence was somewhat stormy and the patient left the hospital three weeks later. Since that time, repeated roentgenograms have been taken of the remaining left kidney. It has greatly hypertrophied and the calculus contained in it has taken on a coral shape and has almost entirely filled the pelvis and calices and on Feb. 6, 1930, measured approximately 8 by 3 cm. This calculus is apparently of a harder nature than those that had been present in the right kidney as no pieces have broken off. There has been no obstruction of the left ureter nor any passage of small calculi. The patient has refused operation on the remaining kidney and in spite of the huge stone in his solitary kidney enjoys fair health some six years after nephrectomy for right sided calculus pyonephrosis.

This case exemplifies the importance of early surgical intervention for stone before renal insufficiency and advanced infection has set in, making the patient a poor surgical risk. It also demonstrates that stones, multiple, coral-shaped or otherwise, in which fragments separate and pass down the ureter, should be removed at once. These might completely obstruct the ureter at any time and in kidneys presenting chronic pyelonephritis cause invasion of the cortex by the infecting organisms present, resulting in complete destruction of this organ.

ETIOLOGIC RÔLE OF STASIS AND INFECTION

The etiology of stone formation is still unsolved; however, in certain individuals it is due to chemical and metabolic processes more or less influenced by the food intake. Keyser [1] was able to reproduce calculi in the kidneys of rabbits by feeding experiments. Holmes and Caplan [2] recently made a geographic survey of stone in the United States and attributed the high incidence of stone formation in southern Florida to the excessive intake of fruits and vegetables; the alkaline ash producing foods overwhelm the protective mechanism in the urine, resulting in the formation of stone. It is not uncommon to see calculi rapidly increase in size in patients who, in their zeal to combat acidity and prevent stone formation, overwhelm the system with mineral waters of high alkaline concentration. Numerous investigators have emphasized the rôle of faulty metabolism brought about by diet and climate, yet it is not in the scope of this paper to discuss them. In some instances stone formation is favored by stasis, as evidenced by finding stones in the bladder and kidneys where free drainage is obstructed by the hypertrophied prostate or by a urethral stricture. Likewise, one often finds stones in kidneys presenting congenital anomalies, such as the horseshoe kidney, ectopia, bifid pelvis and ureter, congenital hydronephrosis and hydro-ureter, in which the drainage of urine is impeded by malformation. Hunner [3] has called attention to the rôle of the ureteral stricture in the production of stone. Burford,[4] Ward [5] and Pillet [6] have emphasized the incidence of stone in ptotic kidneys. Forty per cent of the cases here reported presented stasis in the upper and lower urinary tract (table 4), and as far as I was able I corrected these obstructive lesions.

Infection also plays a rôle in the production of stone. There is no doubt that certain stones form around a nucleus consisting of bacteria.[7] The bacteria cohere by aid of mucinous cement material present on top of which urinary salts are readily precipitated. In others, precipitation of urinary salts is due to chemical changes caused by the micro-organisms themselves. On the other hand, infection may be the result of chronic irritation due to the stone, which reduces the local resistance of the kidney, making it more susceptible to invasion. After infection has set in it may cause the formation of secondary stones. The secondary rôle of infection in certain cases is exemplified by the prompt disappearance of inflammatory processes sometimes following the removal of stone. After the removal, pyelonephritis

1. Keyser, L. D.: The Mechanism of the Formation of Urinary Calculi, Ann. Surg. **77**: 210 (Feb.) 1923.
2. Holmes, R. J., and Caplan, M. M.: A Study of the Geographic Incidence of Urolithiasis with Consideration of Etiological Factors, J. Urol. **23**: 477 (April) 1930.
3. Hunner, G. L.: Calculus of the Upper Urinary Tract Treated by New Methods; End-Results, J. Urol. **20**: 61 (July) 1928.
4. Burford, C. E.: Nephropexy for the Relief of Ureteral Kinks Associated with Ptosis, J. A. M. A. **88**: 541 (Feb. 19) 1927.
5. Ward, R. O.: Urinary Calculi Composed of Bacteria, Brit. J. Surg. **14**: 230 (Oct.) 1926.
6. Pillet, E.: Les calculs de la lithiase urinaire secondaire sont des nids microbiens, Assoc. franç. d'urol., XXVIII Congres, 1928, p. 551.
7. Ward (footnote 5). Pillet (footnote 6).

(35 per cent) was treated by pelvic lavage and the administration of urinary antiseptics. In addition I acidified the urine of patients presenting alkaline stones and alkalized the urine of patients presenting acid and cystine stones, regulated the diet based on a chemical analysis of the stone found, and limited the patient to distilled water. It was observed that recurrence was greater in kidneys in which it was impossible to relieve the infection.

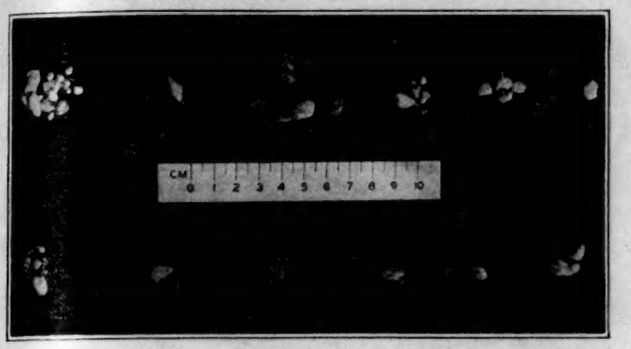


Fig. 2 (case 1).—Fragments detached from coral-shaped stones in both kidneys either expelled spontaneously or removed through the operating cystoscope.

All patients were carefully examined for all possible foci of infection in other parts of the body with specific attention to infections of the skin, tonsils, sinuses and middle ear, teeth and infected genital organs.

As far as I was able I corrected stasis and infection and, further, I deduced that recurrence noted in 20 per cent of the cases was due either to improper surgical technic favoring the leaving of fragments or to an inherent predisposition of the patient to form stone. Although all foci of infection had been removed and renal infection and stasis relieved, the rôle of faulty metabolism is exemplified by the fact that calculus occurred in the opposite kidney (9 per cent of cases).

PATHOLOGIC EFFECTS OF STONE

It matters little whether infection is directly the cause of stone formation or whether the stone is responsible for infection. If the stone is not removed it may lead to infection of the kidney and by irritation and pressure cause ulcerative necrosis or abscess formation. When it occludes the pelvis or a calix it may even cause invasion of the parenchyma by infecting organisms resulting in a single abscess or suppurative nephritis more or less destructive to the kidney. If unchecked, the pathologic process extends to the perinephric tissues by way of the lymphatics or by direct invasion giving rise to perinephritis, sclerotic peripyelitis, paranephritis or perinephric abscess. If unrelieved, a perinephric abscess may perforate the diaphragm and invade the lung, as was observed in one of my cases in which a lung fistula resulted. The stone or its accompanying infection can act as a focus of stone formation and hematogenous infection of the opposite kidney. The occluding stone often results in hydronephrosis, so commonly observed, with thinning of the sac, or less frequently to sclerosis of the pelvis with thickening of the wall and perirenal fat. Stone may also cause spontaneous rupture of the pelvis, as was observed in two of my cases, and renders the kidneys more susceptible to traumatic rupture by reason of the thinning of the pelvic wall due to hydronephrosis.

The constant irritation of the calculus in the kidney sometimes leads to tumor formation. When accompanied by streptococcic pyelonephritis it is sometimes a factor in causing invasion of the blood stream, producing septicemia, endocarditis and death. This was observed in two cases presenting this type of infection, in which the calculi were not removed from the kidney.

TREATMENT

In treating kidney stone, the greatest precautions should be taken to conserve renal tissue and to prevent recurrence. These consist of the employment of the proper operative procedure, which is determined by the size, shape and position of the stone and after removal the application of all prophylactic measures against future stone formation. Stones measuring less than 5 mm. in diameter can be encouraged to pass into the ureter and bladder by cystoscopic maneuvers. These consist of enlarging the constricted ureteral orifice by meatotomy, progressive dilation of the ureter with catheters and bougies, and the employment of succussion, recently advocated by Bransford Lewis.[8] Ten per cent of the cases presenting stone, reported in this series, passed into the bladder following these manipulations and were either voided spontaneously or removed with rongeur forceps through the operating cystoscope. When the stone has a greater diameter than 6 mm. one should resort to surgical intervention, employing pyelotomy, nephrotomy, pyelonephrotomy or nephrectomy. Operation is particularly contraindicated in the aged. Quiescent, silent, nonobstructing stones in kidneys presenting no infection were left alone. The disintegration of a cystine stone by pelvic lavage with alkaline solutions, recently reported by Crowell,[9] offers great possibilities of dissolving stones in situ, employing either acids or alkalis, based on chemical analysis of the urine and of fragments that might have been passed.

Fig. 3.—The end-result of untreated renal calculi is exemplified by this kidney removed from a woman, aged 41, presenting calculous pyonephrosis in which the organ was entirely destroyed by urea-decomposing organisms.

Pyelotomy.—This operation has become popular because it is benign, is safe, offers an easy approach, sacrifices little renal tissue, and is unlikely to be followed by hemorrhage. It is ideal for smooth stones situated in any portion of the pelvis and particularly for those which obstruct the ureteropelvic outlet.

8. Lewis, Bransford: Stones in the Kidney Pelvis: A Nonoperative Method of Removal with the Aid of the Cystoscope, J. A. M. A. **85**: 1056 (Oct. 3) 1925.
9. Crowell, A. J.: Cystin Nephrolithiasis, J. Urol. **11**: 545 (June) 1924.

Because of its facility, pyelotomy is also applied to pelvic stones, coral-shaped and otherwise, which contain single or multiple branches extending into the calices of the kidney. Some surgeons crush these stones and extract or wash away the smaller fragments. Stones situated in the lower, middle or upper calix can also be located and removed through the pelvic incision. Unfortunately, in performing pyelotomy and particularly when the stone is crushed, one is likely to leave small fragments which will not even show in making a fluoroscopic examination or in taking roentgenograms at the time of the operation, as suggested by Braasch and Carman [10] or by Quinby,[11] nor be detected by careful palpation. These fragments are sometimes firmly attached to the stone bed and although infinitesimal in size act as nuclei for future stone formation. In the twenty-two kidneys from which stones were removed by pyelotomy, five recurred (22 per cent), two in the lower calix, two in kidneys presenting a large branched stone that had extended into the calices, and one in the middle calix.

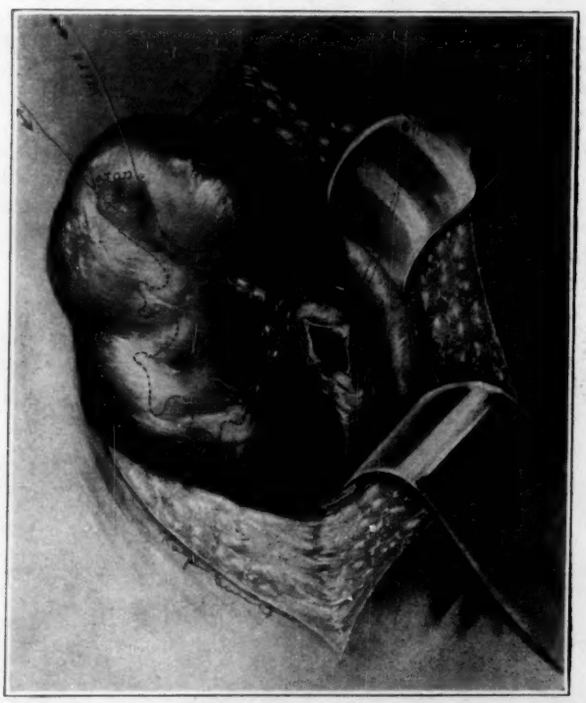


Fig. 4.—Pyelonephrotomy for stone: An incision is made in the pelvis through which the index finger is inserted to support the stone from below. Single or multiple nephrotomy incisions are made with a silver wire after the stones have been located by needling. Prior to operation, a catheter is placed in the ureter in order to irrigate the pelvis and to prevent fragments from passing into the ureter.

Nephrolithotomy.—This type of intervention is indicated when one encounters an intrarenal type of pelvis. It is more likely to be accompanied by hemorrhage at the time of operation or secondary hemorrhage occurring usually from ten to fourteen days later. It also has the disadvantage of sacrificing a certain amount of renal tissue and gives a poorer approach for removing that portion of the stone extending into the pelvis. The employment of the silver wire which pushes aside the larger ramifications of the renal vessels and severs only the smaller terminal branches reduces the amount of renal tissue destroyed. In order to conserve kidney tissue, one should attempt to remove stones by multiple nephrotomy incisions when possible rather than by laying the kidney wide open by one huge incision. Although this operation is more dangerous than pyelotomy, it should be employed when the latter is too difficult.[12] It has the advantage of being followed by fewer recurrences.[13]

Pyelonephrotomy.—The combination of pyelotomy and nephrotomy, although not in general use, is ideal for the removal of a calculus situated in a calix or pelvic stones whose branches extend into one or more calices. It permits one to remove the smaller ramifications through single or multiple nephrotomy incisions and assures extraction of the portion of the stone located in the pelvis. An incision is made in the posterior wall of the pelvis, the finger is inserted, and the stone is palpated and kept in place by firm gentle pressure. At the same time it is located from without by the aid of a small groove director or blunt needle,[14] which acts

TABLE 1.—*Incidence According to Sex*

Male	44
Female	30
Total	74

TABLE 2.—*Incidence According to Age*

0–10 years	1
10–20 years	4
20–30 years	13
30–40 years	13
40–50 years	13
50–60 years	12
60–70 years	17
70–+ years	1
Total	74

TABLE 3.—*Incidence According to Side Involved*

Right	39
Left	28
Bilateral	7
Total	74

TABLE 4.—*Predisposing Lesions*

Pyelonephritis	26
Ureteral stricture	15
Renal abscess	8
Renal ptosis	8
Prostatic hypertrophy	5
Urethral stricture	2
Renal tumor	2
Bifid pelvis and ureter	2
Tuberculosis	2

TABLE 5.—*Pathologic Effects of Stone*

Pyelonephritis		26
Renal abscess		21
Multiple	15	
Single	6	
Destructive pyonephrosis		19
Hydronephrosis		15
Perinephritis		5
Peripyelitis—sclerosis, thickening of perirenal fat		5
Ulcerative necrosis		4
Sclerosis of pelvis		3
Perinephric abscess		3
Spontaneous rupture of kidney		2
Renal tumor		2
Streptococcic septicemia with endocarditis		2
Lung fistula		1

10. Braasch, W. F., and Carman, R. D.: Renal Fluoroscopy at the Operating Table, J. A. M. A. **73**: 1751 (Dec. 6) 1919.

11. Quinby, W. C.: Operative Treatment of Renal and Ureteral Calculi, J. Urol. **11**: 539 (June) 1924; A Note on the Localization of Renal Calculi by the Aid of X-Ray Films Made During Operation, J. Urol. **13**: 59 (Jan.) 1925.

12. Van Cappellen: Résultats éloignés des opérations contre la lithiase rénale, Sec. Cong. della Soc. Internaz. de Urol., Rome, 1924, p. 303.

13. Rafin, M.: Résultats éloignés des intervention pour lithiase rénale, Sec. Cong. della Soc. Internaz. de Urol. Rome, 1924, 283.

14. Burns, J. E.: A New Method for Locating Small Calculi in the Kidney at Operation, J. Urol. **1**: 559 (Dec.) 1917.

as a guide for opening the parenchyma with a silver wire. The stone is then extracted with forceps or pushed out from its bed by the finger below. In this manner there is less likelihood of losing the stone or of breaking off or leaving fragments.

TABLE 6.—*Type of Stone with Location in Kidney*

Pelvis (more or less smooth variety)	24
Multiple	10
Lower calix	10
Bilateral	8
Coral-shaped involving pelvis and calices	7
Irregular faceted	5
Upper calix	5
Middle calix	5
Total	74

TABLE 7.—*Result of Examination*

Clinical roentgenographic examination positive		70
Clinical roentgenographic examination negative		4
Confirmed at operation	2	
(870 renal operations in which kidney palpated)		
Confirmed by passing stone	2	
Total		74

TABLE 8.—*Enumeration of Cases with Type of Operation*

Pyelotomy		22
Nephrectomy		19
Pyelolithotomy		11
Nephrolithotomy		8
Passed after cystoscopic maneuvers		7
Ureteronephrectomy (coexistent ureteral stone)		6
Passed after succussion		1
Total		74
Renal exploration with failure to find stone		4
Calcified cortical abscess	2	
Calcified glands	1	
Calcified blood vessels	1	

TABLE 9.—*Coincident Corrective Operation*

Nephropexy	8
Decapsulation	5
Resection of aberrant vessel	5
Plastic operation on pelvis	3

TABLE 10.—*Postoperative Management*

1. Clearing up of foci of infection in skin, tonsils, teeth, sinuses, ear, genital organs in men and women, etc.
2. Clearing up of stasis in upper and lower urinary tract.
3. Clearing up of chronic pyelonephritis.
4. Regimen. Diet based on chemical analysis of stone. Intake of distilled water only.
5. Subsequent examination of patient. Roentgenograms of urinary tract every three to six months. Monthly complete urinalysis.

TABLE 11.—*Recurrence of Stone*

	Number of Cases	Per Cent
After pyelotomy (22 cases)	5	22
After nephrotomy (11 cases)	2	18
After pyelonephrotomy (8 cases)	1	12
After passage following cystoscopic maneuvers (7 cases)	2	28
In opposite kidney after nephrectomy (19 cases)	6	31
Total recurrence after all methods of treatment		20
Mortality	2	2.7

At the time of operation, faulty drainage should be corrected; the ptotic kidney should be anchored to the last rib by nephropexy. When not too large, anomalous vessels obstructing the ureteropelvic junction should be resected and valvular and other constrictions of the ureteropelvic outlet corrected by the proper plastic operation. Coincident abscesses should be drained and in certain cases of advanced infection a rubber drain tube is inserted into the pelvis and brought out through the parenchyma of the kidney for the purpose of lavage. During the operation, fragments are likely to pass down the ureter and cause subsequent trouble. This is prevented by passing a large ureteral catheter into the pelvis prior to intervention. It facilitates location of the upper portion of the ureter, allows one to make a constant lavage of the pelvis with a mild antiseptic solution and to wash away small fragments. It assures ureteral drainage after the operation.

It is today acknowledged that large coral-shaped, silent, nonobstructing stones should be left alone. In certain coral-shaped stones, however, fragments break off, pass into the pelvis and ureter and may be arrested at the ureteropelvic junction or along the ureter. The resulting obstruction leads to backpressure and in the event of chronic pyelonephritis may cause invasion of

Fig. 5.—A stone is either pushed away from its bed or removed with forceps. Contrapressure by the finger assures more complete removal of the stone and less likelihood of leaving fragments.

the cortex, ending in suppurative nephritis which partially or completely destroys the kidney. I have observed this type of coral-shaped stone in five patients. In one, the kidney was completely destroyed and the patient's life was saved by prompt nephrectomy. In the second case, impaction of the stone caused rupture of the kidney necessitating immediate intervention. In the third, a fragment obstructing the ureteropelvic junction was responsible for the formation of multiple cortical abscesses accompanied by a huge perinephric abscess. In the fourth, the coral-shaped stone occurred in a patient possessing a solitary kidney and the destruction of this organ by multiple abscesses resulted in death. In the fifth, a fragment obstructed the ureteropelvic junction, causing complete blockage. The other kidney had been destroyed by a pyonephrotic process and as the patient refused operation she rapidly went into uremia and died. If a patient presenting coral-shaped stone of one or both kidneys gives a history of passing fragments, operative intervention should be instituted at once. The early removal of this type of stone

assures elimination of urine and conservation of renal tissue. In addition, the patient is surely a better risk than at a later date, at which time advanced infection or renal insufficiency will have taken place. If the stone recurs, it can again be removed. I successfully performed three consecutive operations for this type of recurring coral-shaped stone with relatively little damage to the functioning power of the kidney.

OPERATION ON SOLITARY KIDNEY

In removing stones from the solitary kidney due to congenital deformity, or disease, or surgical removal of its fellow, drainage of the urine from the kidney must be assured at all times and the technic exacting. A wider incision assuring good exposure should be made, sacrificing the twelfth rib when necessary; extreme gentleness should be employed in handling the kidney, and blood vessels should not be sacrificed. The pyelotomy incision should not be sutured in order to assure good drainage of urine. Decapsulation should be made to avoid postoperative congestion. Partial

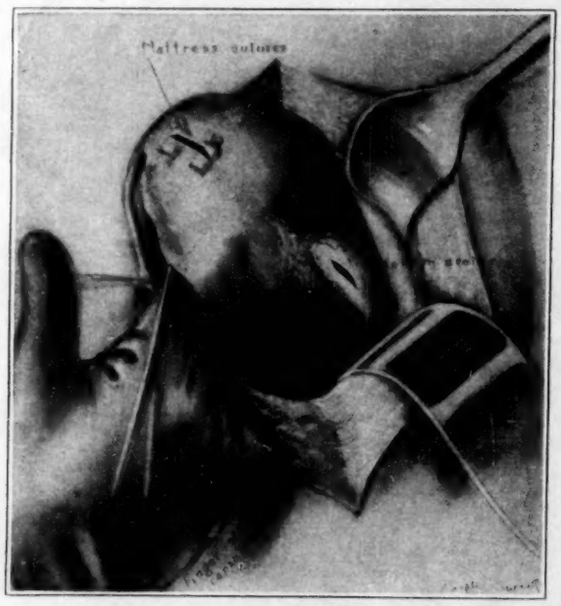


Fig. 6.—After the nephrotomy incision has been closed by mattress sutures, partial decapsulation is performed in order to minimize postoperative congestion. The capsule is separated for a slight distance only and allowed to remain on the convex surface. This facilitates subsequent operative approach of the kidney. The pyelotomy incision is not sutured in solitary kidney.

decapsulation is performed in such a manner as to assure the minimum amount of kidney surface adhering to the surrounding structures and facilitates surgical approach if it becomes necessary to operate on the kidney at a future date. This is accomplished by incising the capsule longitudinally, bluntly stripping it from the kidney with the finger for a slight distance only, and replacing the capsule on the convex surface of the kidney (fig. 6).

Nephrectomy.—In individuals prone to stone formation, early nephrectomy for destructive calculous pyonephrosis removes the focus of infection, which is often the cause of subsequent infection and stone formation in the opposite kidney.[15] It is realized that the kidney has a remarkable regenerative power and it is not sacrificed when there is reason to believe that the function might return after the removal of the obstructing calculus. When multiple abscesses are encountered and when the kidney is nothing more than a sac of pus or a bag of stones, it should be removed. It is often hard to measure the amount of destruction present and to ascertain the recuperative power of the kidney. Nephrectomy is particularly indicated when there is advanced unilateral infection with urea-decomposing organisms.[16] In cases presenting coincidental calculi of the lower ureter, a complete ureteronephrectomy should be performed. These calculi prevent atrophy of the ureter, cause attacks of pain, and in many instances are responsible for persistence of infection in the bladder, which in turn might extend to and involve the remaining kidney. In two cases in which the kidney had been previously removed by other surgeons, it was found necessary to remove the lower ureter containing stones because of persistent pain and cystitis.

After-Care.—A roentgenogram should be made before the patient leaves the hospital to assure oneself that all fragments have been removed. The patient sometimes passes fragments following the operation. A routine roentgenogram of the entire urinary tract should be made every three to six months and the urine carefully analyzed for pus and blood, the presence of which points to infection with or without stone. The finding of macroscopic or microscopic blood usually indicates recurrence of stone.

SUMMARY

1. The modern management of kidney stone includes many prophylactic measures; viz., early nephrectomy for destructive calculus pyonephrosis which might act as a focus for stone formation in its healthy fellow, the clearing up of foci in other parts of the body, the elimination of predisposing lesions consisting of stasis in the upper and lower urinary tract, the eradication of renal infection, and the correction of faulty metabolism with a diet based on a chemical analysis of the recovered stone.

2. Obstructive stones cause backpressure, resulting in certain pathologic lesions; viz., hydronephrosis, suppurative nephritis, abscess formation, perinephric abscess and spontaneous rupture of the kidney. Nonobstructive stones are a source of continual irritation to the kidney, lowering its resistance and making it more susceptible to tumor formation and to infection. Early removal of nonobstructive stones as well as the obstructive type conserves renal tissue and lengthens life.

3. The so-called nonsurgical, coral-shaped, silent, nonobstructing stone in which fragments break off, pass into the pelvis and ureter threatening obstruction, should be removed at once.

4. Recurrence of stone occurred in 20 per cent of the seventy-four cases treated. As all predisposing lesions such as stasis, renal infection and foci of infection elsewhere were systematically corrected, it might be deduced that recurrence was due to faulty metabolism or to the leaving of fragments at the time of operation. Recurrence after operation (19.7 per cent) can be further reduced by the employment of x-rays at the time of the intervention and by the intelligent selection of the proper type of operation based on the position and character of the stone. Nephropyelotomy assures a more thorough removal of branched pelvic stones and stones in the calices.

450 Sutter Street.

15. Nicholich, G.: Sur la néphrolithiase bilatérale, Assn. franç. d'urol. **14**: 510, 1910. Rovsing, C. M.: On the Signification of Infection for Recurrence After Kidney Stone Operations, Sec. Cong. della Soc. Internaz. de Urol., Rome, 1924, 269. Hogge, A.: Opérations pour lithiase rénouréterale, Sec. Cong. della Soc. Internaz. de Urol., Rome, 1924, p. 253.

16. Rovsing (footnote 15).

ABSTRACT OF DISCUSSION

DR. A. H. PEACOCK, Seattle: The study of renal calculus opens up at once an interesting question, for every stone is a problem by itself. I do not think that any rule can be laid down from experience that will apply to all cases. However, there are certain particular symptoms in these cases and there are certain broad considerations one could follow that are of great assistance. We are not infrequently called to see these patients and to give advice, and I think our advice should be a matter of judgment and experience. We should be influenced first of all by the size of the stone. I think we all realize that the small stone frequently will pass on into the bladder and be expelled in the natural way. Stones over 1 cm., in my experience, will not do this but the smaller stones will often pass on, perhaps with some manipulation of the ureter, and be voided through natural channels, thus offsetting a serious operation. On the other hand, I have seen some serious complications following the too frequent use of the transvesical manipulation of the ureter in an attempt to dislodge a stone. Even when the stone is finally passed, the infection resulting from manipulation has persisted for months in some instances. I think that manipulation of stones in the ureter is not advisable and believe that they should be removed by surgery if they show no tendency to pass on. The indications for surgery in my experience have been, first of all, infection. These cases which have become infected will not clear up and the earlier the stones are removed the better. The second thing is hematuria. This is often quite severe, especially in the polycystic kidney. Another thing is tenderness and pain, continuous in nature. Often these patients will have an attack of renal colic, recover from it and not have another for six months or a year. On the other hand, some patients will have repeated attacks of pain occurring at short intervals, and I do not think that these patients should be worn out by repeated attacks of colic without some surgical relief. Another indication for surgery, to my mind, is impaired unilateral function, proved by pyelogram and chemical tests, showing that destruction of the kidney is going on. In the contraindications, I think that first of all comes the silent stone. I do not mean the type that Dr. Mathé mentioned, for that was not silent, but the type with which there are practically no symptoms and no evidence of urinary infection and the stone that is found through a general examination.

DR. WILLIAM F. BRAASCH, Rochester, Minn.: The silent renal stone is one of the most interesting conditions to be considered. It is often quite a problem to decide whether or not to operate on a stone that is causing no symptoms. The more experience I have the more am I inclined to advise operation in every case, unless there is some definite reason against it. Because of age, coincident complication, the possibility of spontaneous passage or because the stone is too large to attempt removal, I might not wish to advise operation. It is usually advisable in such cases to keep the patient under observation and watch the increase in the size of the stone by repeated roentgen examinations. These stones may be silent so far as subjective symptoms are concerned, but they are never silent in their injurious effect on renal tissue and usually cause destruction of the kidney. I was much interested in the various etiologic factors that Dr. Mathé pointed out, and particularly in the large percentage of cases in which he found ureteral stricture to be an apparent cause. It is quite as difficult to say whether a stricture found at operation is primary or secondary as it is to determine its presence clinically. Renal or ureteral stone is so often found without any evidence whatever of stricture that it can hardly be a common etiologic factor. Furthermore, when one considers that over 90 per cent of the patients operated on for stone in the ureter or kidney did not have a recurrence, and this in spite of no treatment for a supposed stricture, one must infer that stricture cannot be of much etiologic importance. Primary renal infection is not a frequent cause of lithiasis. Chronic pyelonephritis is of common occurrence but is only occasionally complicated by secondary stone. When stone does occur with primary chronic pyelonephritis, it is usually small and of little clinical importance, and surgical treatment is usually not indicated. Should, however, the stone cause pain or should there be an increase in size and infection, it would be advisable to remove it. True pyonephrosis is not a common finding with renal stone, although diffuse pyelonephritis is often observed. It would be reasonable to assume that the pyonephrosis is the result rather than the cause. Infected hydronephrosis, which is often called pyonephrosis, is observed more frequently and may be either primary or secondary. When the hydronephrosis is large, say from 150 to 200 cc., it is usually primary and the stone is of secondary formation. Renal ptosis has been regarded by some observers as a frequent cause of stone. Considering the many cases of ptosis that are seen without lithiasis, one might question whether ptosis is ever an etiologic factor. I have always regarded ptosis as a coincident finding rather than as a primary factor.

DR. FREDERICK T. LAU, New York: The story of urinary calculi is so broad, so interesting and so well understood that I would like to mention just one feature of Dr. Mathé's paper that I greatly enjoyed—the subject of recurrence. I think that in the light of present-day knowledge there are too many recurrences. I think that if one takes into consideration the points of stasis, infection and the chemical composition of the stone there will be fewer recurrences. No one will dispute the fact that stasis is the cause of stone primarily, and it is the cause of recurrence. Stasis in the course of infection causes an excess precipitation of salts in the urine. It is known, too, that the majority of stones that recur are of alkaline rather than of acid composition, and if one analyzes the chemical composition of each stone removed at operation and governs the chemical reaction of the urine according to the result of the chemical reaction of the stone, one discourages in that way the possibility of recurrence. If the stone is acid the urine should be kept alkaline, and if it is alkaline the urine should be kept acid. I had the privilege of reporting a series of cases six years ago in Chicago. The statistics in New York are about the same now as they were then. I spoke of one case at that time which I wish to mention now, to bring out the points I wish to emphasize regarding recurrence. This patient, prior to being seen by me, had had four operations. After she came under my observation she had three operations for continued recurrences of calculi, the earliest being three months and the last three years. When I reported her case in Chicago, in 1924, she had had the last one, in January of that year, and I am happy to report now that there has been no return of calculi since then. Her urine is alkaline; her stone is acid. She carries litmus paper with her and tests her urine regularly. At one time she got a little acidosis but has learned to be on guard. I am glad Dr. Mathé reported so few nephrectomies. I think that physicians are learning to be more conservative and not to sacrifice a kidney unnecessarily.

DR. ROBERT H. HERBST, Chicago: I would like to emphasize the value of renal resection in the treatment of stone in the kidney. This procedure is particularly useful in polar stones that have produced cavities or dilatation of one or more calices; also when such stones have produced a localized infection. In these cases the incidence of recurrence is high following simple removal, while resection leaves a healthy functioning segment with little or no danger of recurrence. The deferred popularity of this method of treatment is due to the unwarranted fear of postoperative hemorrhage and leakage of urine. I recently carried out a study on dogs, resecting a V-shaped segment of the kidney. In practically every instance in which the capsule was first stripped back and then drawn over the cut end, followed by the introduction of mattress sutures, postoperative hemorrhage did not occur. The puckered capsule lying under the sutures is of undoubted value in the control of bleeding. Leakage will not occur from a pelvis that is draining normally. I opened a calix or the main pelvis in all these experiments and never saw any leakage; in many I did not even suture the lining of the pelvis. Another point is the use of the indwelling ureteral catheter in the preoperative treatment of calculous pyonephrosis. A fair number of these very sick patients can be greatly improved by such drainage and an infected case converted into a fairly clean one, thereby greatly reducing operative risk, and, at times, saving a kidney that might require removal without such preoperative drainage.

DR. B. S. BARRINGER, New York: I wish to congratulate Dr. Mathé on his able paper and to say one word about the value of the roentgenogram on the table of the kidney from which a physician thinks he has removed all the stones. I think many have not done that for they think it a difficult procedure.

They can take a small x-ray film and wrap it up in a towel. It is valuable because it checks up whether all the stones have been removed or not. I think that this procedure makes one more careful, more accurate and more delicate in removing these multiple stones. I do not do it as a routine, but I do it in those cases in which I expect trouble, and I think that it has a great advantage over the fluoroscopic method, in that it is more simple and one has a permanent record of the case for one's files. It is not difficult with a small portable x-ray machine.

DR. WILLIAM E. KEANE, Detroit: I think the use of the Caulk scissor incisor with the bipolar current may be an advantage in dislodging some of the stones that are stuck just inside the ureteral orifice. During the past year I have been successful with this method in assisting stones to pass in two such cases in which attempts by all other methods had failed. The platinum blade sears a slit in the ureteral orifice and there is no bleeding to worry about. I think that there are cases in which this method is of decided value and it can be used to advantage when indicated.

DR. ARTHUR L. CHUTE, Boston: I wish to offer a word of protest about "watching" urinary stones for too long a time. I think it should be concluded that a stone in a kidney should not be allowed to remain indefinitely. If it will remove itself in a reasonable time, well and good, but if not, it should be removed. I do not mean that all small stones should be removed the moment they are recognized. I think, in fact, that they should not. The very small stones, 1 or 2 mm. in diameter, will almost certainly be passed and that opportunity should be given; but when there is a stone of any real size, it is another story. The mere fact that it is known that in about 20 to 25 per cent of stone cases there will sooner or later be a stone in the other kidney should cause one to go ahead and remove a renal stone of any size, if possible, before the kidney becomes infected. The fact that this tendency to formation of stones is something more than a local condition should result in their removal if they are not passed within a reasonable time. There seems, for some reason, to be a great fear of opening a kidney through its cortex for the removal of a stone. That, however, seems to me to be the logical route to follow in the removal of large stones in the calices and in the case of stone-bearing kidneys that are more or less dilated. In cases of this sort I think the logical thing to do is to make a sufficient incision through the kidney cortex, remove the stone and fix in a drainage tube. I do not mean that one should operate for a very small stone in a kidney or for one that is coming down to the ureter with reasonably free drainage. I have on a few occasions tried to remove very small renal stones but have found that this is not advisable since I have so injured one or two kidneys by a fruitless search for a small renal stone that I have had to remove them. However, the leaving of larger renal stones in the face of the fact that they are almost sure to destroy the kidney in time, and that stones will appear on the other side in one case in every four or five, is a doubtful procedure.

DR. HERMAN L. KRETSCHMER, Chicago: It has been assumed for a long time that stasis and infection play a rôle not only with the formation of stone but also in connection with recurrences. Most physicians advise pyelotomies when this operation can be done, and also resections of the lower pole when there are evidences of dilatation and stasis; and regardless of these precautions, many of these patients go merrily on and have their recurrences. I was interested in hearing Dr. Braasch say that they have had more recurrences in cases in which pyelotomies were done. I have made it a rule to clear up the infection following the removal of the stone by means of pelvic lavage with silver nitrate, and yet, in spite of these various procedures, some of the patients continue to have their recurrences. The problem of recurrences in kidney stone surgery is a big one deserving much careful study and much thought. One point that has not been emphasized in this discussion is the possible rôle that the kidney cell itself may play. I believe that there are some disturbances of metabolism or function in the kidney cell proper and that this is a factor in a certain number of instances in resulting recurrences.

DR. CHARLES P. MATHÉ, San Francisco: Dr. Edmond Papin has asked me to give his discussion. He recently saw a patient whose case emphasizes the necessity of a thorough urologic examination in all patients presenting persistent pyuria. The patient had the clinical signs and symptoms of unilateral renal tuberculosis. In making the routine roentgenogram a silent stone was discovered in the opposite, uninfected kidney. Before removing the tuberculous kidney he removed the stone from its fellow by pyelotomy, thereby assuring free drainage of urine after the operation. In operating on silent stones, I feel that one should be guided by the same sound judgment that one employs in operating on kidneys in general. Operation is particularly contraindicated in those presenting advanced bilateral stone formation when there is severe infection and in the aged. In regard to cystoscopic maneuvers made in order to encourage stones to pass, I agree that it is unwise to expect a stone measuring 1 cm. to pass through the ureter, in which the diameter rarely exceeds 0.5 cm. Every stone measuring more than 0.6 cm. should be removed by operation. Heminephrectomy has not been sufficiently emphasized. After witnessing the beautiful demonstration of partial resection of the kidney for stone with infection, performed by Professors Papin and von Lichtenberg before the recent meeting of the American Urological Association in New York, I am further convinced of the value of this operation. Dr. W. E. Stevens of San Francisco has also successfully used this procedure. This operation assures removal of the stone as well as of the diseased portion of the kidney in which, as Dr. Kretschmer has pointed out, the renal cells are often at fault, thereby playing a rôle in the formation and recurrence of stone. I fully agree that preoperative care is very important. One attempts to lower the amount of infection by all the modern methods at one's command, including continual ureteral catheter drainage and repeated renal lavage. Recurrence should be combated energetically. I recall a patient in whom a stone recurred after three successive nephrolithotomies. Because of this a minute examination of the urine was made and its reaction changed by placing the patient on an acid. The stone has not recurred.

RADIATION THERAPY IN CANCER OF THE MOUTH

WITH ESPECIAL REFERENCE TO THE USE OF PURE GAMMA RAYS *

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AND
J. H. VASTINE, M.D.
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The fact that the British government has recently purchased 20 Gm. of radium, that New York State is to add 4 Gm. to its present holdings and that many institutions devoted entirely to the treatment of cancer, such as the Radium Institute in Paris, the Radiumhemmet in Stockholm and the Memorial Hospital in New York depend in great part on radium for their results, indicates definitely the recognition of the value of irradiation in the treatment of cancer. The greatest fields of usefulness, however, have been in cancer of the skin, the mouth or the uterus.

We believe that most cancers of the mouth can be prevented by eliminating all forms of irritation, such as come from tobacco, jagged or sharp edged teeth, infected gums, badly fitting plates or foreign bodies, and by eliminating syphilis.

The best time to cure cancer, even by irradiation, is in its earliest stages. Accurate and early diagnosis is therefore a most important factor. Cancer of the

* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of an illustration. The complete article appears in the authors' reprints.

* Read before the Section on Radiology at the Eighty-First Annual Session of the American Medical Association, Detroit, June 25, 1930, and associated with an exhibit of casts, drawings, materials and lantern slides in the Scientific Exhibit; therefore few illustrations of the technic are being published.

mouth nearly always gives some symptom that should attract the patient's attention early. Any lesion in the mouth can be easily seen and palpated. Therefore, if the patient and the physician are alert, there is no good excuse for not diagnosing cancer in its earliest stages. Better still, the lesions preceding cancer should be diagnosed and, if they are properly treated, many cancers

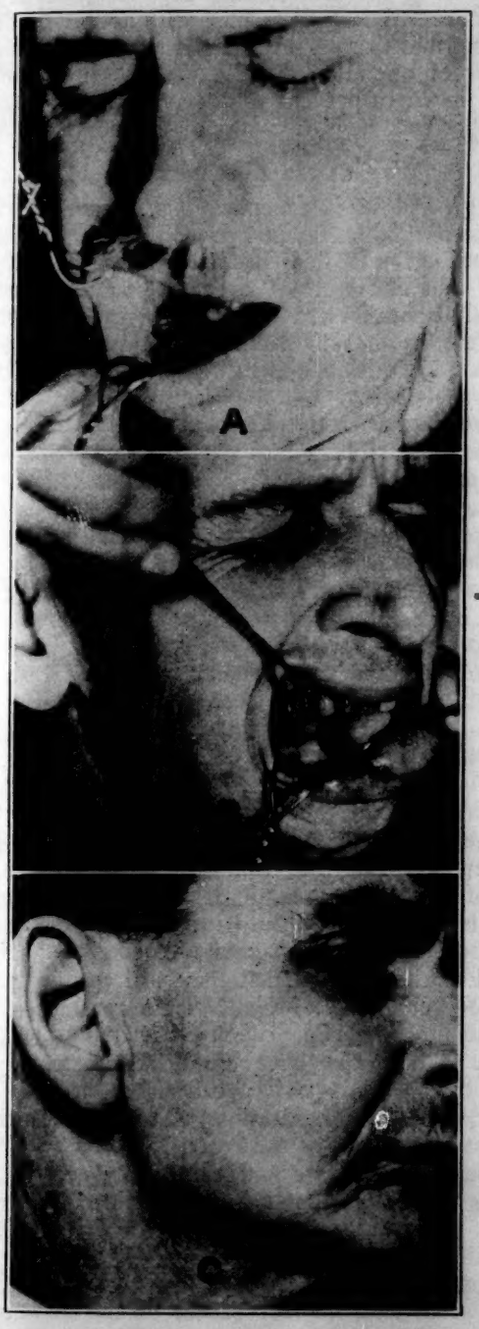

Fig. 1 (case 1).—F. P. P., a man, aged 43, referred by Dr. S. Irwin Darnall, Sept. 26, 1927, with recurrent carcinoma involving 2½ inches of the right lower jaw, and producing a mass of tumor, about the size of half a hen's egg, and associated with destruction of the jaw bone below the inferior dental canal: *A*, before treatment; *B*, June 9, 1928, showing area completely healed; *C*, Oct. 13, 1928, showing that the results have been accomplished without any damage to the skin.

can be prevented. We believe that most cancers of the mouth evolve from some preceding, slowly developing lesion.

There may be white patches or a general whiteness of the mucous membrane, which is almost transparent at the beginning, and later this may become thickened, warty and ulcerated. At this later stage it is usually cancerous. This leukoplakia is most commonly found in those who use tobacco excessively, either smoking or chewing, and it occurs especially when there is some associated local irritation from a jagged or sharp edged tooth or badly fitting plate. This preliminary condition can be corrected by eliminating tobacco and the irritation, using an alkaline mouth wash, and if necessary by skilful destruction by electrocoagulation. If there is thought of cancer, a section should be removed for microscopic examination and in addition the area should be treated locally within radium at once, while waiting for the report. We have never seen any ill effects from the removal of a specimen, provided the area is treated immediately before or immediately after the biopsy. The danger from a biopsy results from the delay in treatment, and the growth is increased as a result of the increased blood supply that follows nature's method of repair.

At times an irritation ulcer is present, resulting from some jagged or sharp edged tooth or badly fitting plate. These ulcers, if found early, may disappear after the simple removal of the irritation, or they may become indurated and definitely malignant. One must think of cancer when there is no tendency to heal after two weeks.

A papilloma may develop from one cause or another, which in turn may be subjected to traumatism and then become malignant. For this reason we believe in the prompt destruction by electrocoagulation of any such lesion as soon as it is demonstrated, doing a biopsy if there is thought of a malignant condition.

Local induration of the togue must be viewed with suspicion and kept under close observation. Malignant disease beginning in this manner is always the most difficult to diagnose, and the greatest clinical experience should be utilized.

Cancer of the lip, in which cures are obtained in practically all cases if treated at the beginning, will not be discussed in this paper.

THE USE OF PURE GAMMA RADIATION

We have obtained some rather brilliant results in the past with electrocoagulation, insertion of radium needles, and combinations of these with surgery; but for the most part the ultimate results have been disappointing, and even those patients who were cured went through much suffering and distress. Acting on the biologic principles of irradiation laid down by Regaud, we increased our filtration and prolonged the application of radiation. The end-results were so much superior to the former results obtained that we have adopted this method as a routine. We presented the matter after invitation of the British Empire Cancer Commission before the International Conference on Cancer held in London in July, 1928,[1] and discussed it further before the American Radium Society in 1929.[2] Later, while visiting the Radiumhemmet in Stockholm and the Curie Institute in Paris, we found that practically the same methods were being used and with similar results.

This improved technic is based on two fundamental principles laid down by Regaud.[3] He recommends that

1. Pfahler, G. E.: Pure Gamma Radiation in the Treatment of Carcinoma of the Buccal Cavity, Proceedings of the International Conference on Cancer, July 16 to 22, 1928; published by the British Empire Cancer Campaign, London.
2. Pfahler, G. E.: Improved Technic for the Use of Highly Filtered Gamma Rays in the Treatment of Cancer of the Mouth, Proceedings of the American Radium Society at its Annual Meeting, Portland, Ore., July 7 and 8, 1929.
3. Regaud, C.: Some Biological Aspects of the Radiation Therapy of Cancer, Am. J. Roentgol. **12**: 97 (Aug.) 1924.

irradiation be prolonged so as to destroy all the cancer cells in the process of division, and says, "It is useless to expect to kill all the cells of a squamous cell cancer; it is sufficient to kill the mother cells; the others, which form practically the whole mass, disappear gradually by transformation and resorption." His idea, therefore, is that a moderate amount of irradiation continued over a considerable time is better than a great amount of irradiation given in a short time. His second principle is indicated by the following: "As the radiation becomes more penetrating, the diffuse necrotizing effects diminish, then practically disappear, and finally only the selective effects remain, which are manifested in the most radiosensitive cells, which are the cancer cells in the process of division."[4] So far as we are aware, we were the first to carry these two principles to such a high degree, namely, the filtration of rays from the radium through the equivalent of 3 or 4 mm. of lead and the prolongation of the effect during three or four weeks' time. In this way one also combines the principles of the "saturation method"[5] by keeping the radiation effects up to the limit of normal tissue tolerance for a considerable time. Regaud says:

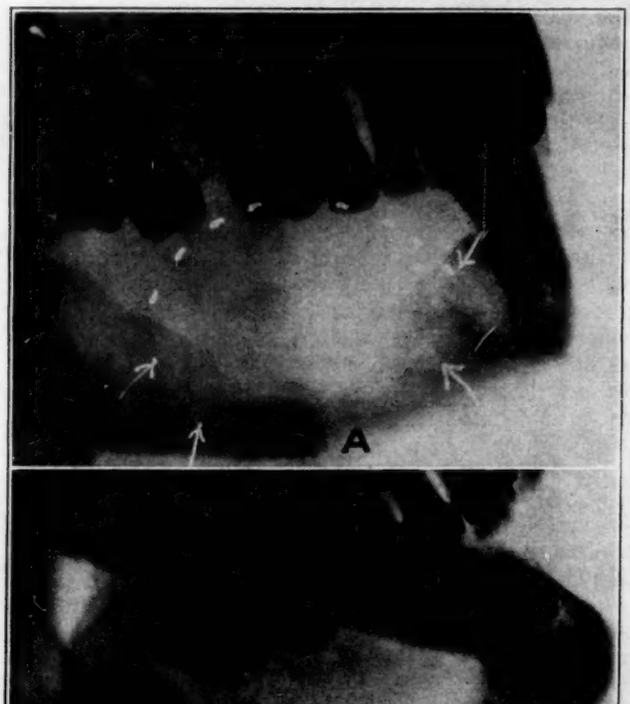

Fig. 2 (case 1).—Condition of jaw bone: *A*, Sept. 26, 1927, showing involvement; *B*, April 6, 1929, showing healthy condition of the bone. The patient has remained well to date. It had been thought previously that when the bone was invaded the patient could not recover by irradiation.

> When radium punctures was first begun it was thought that it might become the method of choice in the majority of cancers. Instead, its use has been greatly restricted so that at present it is employed only for cancer of the tongue, and at times for thick exhuberant cancers of the skin.

Since using the method here described, we have had much more satisfactory results, with almost no damage to the normal tissues. We believe that by eliminating the fear of operation and the fear of mutilation one will do much to prevent the delay that now occurs in the proper treatment of cancer of the mouth.

GENERAL TECHNIC

For general surface applications, as a rule, we use the beeswax and hard wood powder compound that was developed at the Radium Institute in Paris by Esquerra, Monod and Richard.[6] We use 1 pound of beeswax, 1 pound of paraffin and 2 ounces of hard wood powder. As a rule, from 1 to 2 cm. in thickness is sufficient, and the additional thickness and distance are obtained by the use of felt. At the Paris Institute, blocks of cork are used to add thickness. The wax compound is melted and molded into plaques 15 by 33 cm. and 1 or 2 cm. in thickness. For use, this wax is softened in hot water and then molded to the part to be treated and fixed by dipping in cold water. It is then built up to the desired thickness of from 4 to 5 cm. by means of felt. The outer surface is then covered with adhesive plaster, having the sticky surface outward. The radium units are then placed as desired and held in place by strips of adhesive plaster. The radium is distributed over the surface in 5 or 10 mg. units according to the location of the disease and the effects to be produced. We usually employ from 100 to 300 mg. on these packs. The adhesive plaster is softened and removed, when desired, by means of carbon tetrachloride.

These wax molds are applied externally and permit the preparation of the radium packs for treatment of cases of the mouth with the least amount of exposure of the technician; they can be quickly applied and thus reduce the exposure of the radiologist; and they are molded to the part, so that they will remain in place, and the radium will always be at a constant distance. The packs are held in place by bandages and adhesive plaster. The packs have the disadvantage of being rather heavy. The weight can be reduced by using gold or platinum for filtration instead of brass or lead, but that also increases the cost. Whenever it is practical we use felt alone and omit the wax, which also reduces the weight, but it is applicable only when the surface of application is rather flat and the area over which the radium is to be applied is small.

Generally, we apply the radium to both sides because of the great tendency for cancer of the mouth (even cancer of the cheek) to spread to the opposite side. The chief object of these packs is to prevent or eliminate the metastases and in our hands they have been effectual. We usually use from 150 to 200 mg. to the affected side and from 50 to 100 to the opposite side, arranging it so that on the affected side we center on the most likely region of lymphatic extension.

By means of these packs, we commonly use from 20,000 to 50,000 milligram hours of radium element irra-

4. Regaud, C.: Radium Therapy of Cancer at the Radium Institute of Paris, Am. J. Roentgenol. **21**: 1-24 (Jan.) 1929.

5. Pfahler, G. E.: The Saturation Method in Roentgentherapy, as Applied to Deep Seated Malignant Disease, Brit. J. Radiol. **31**: 45-58 (Feb.) 1926; Further Observations on the Saturation Method in Roentgen Therapy as Applied to Deep Seated Malignant Disease, Am. J. Roentgenol. **20**: 233-241 (Sept.) 1928. Pfahler, G. E., and Widmann, B. P.: Further Observations on the Use of the Saturation Method of Radiation Therapy in Deep Seated Malignant Disease with Some Statistics, Radiology, September, 1928; Strahlentherapie **32**: 91 (March 23) 1929.

6. Esquerra, A.; Monod, C., and Richard, G.: Généralitiés sur L'emploi des substances plastiques en curietherapie de surface, J. de. radiol. et d'électrol. **6**: 331-341, 1922.

diation in surface application, externally, at a distance of 4 cm. We have found that under these circumstances we can give as our limit about 24,000 mg. hours within two weeks and usually 36,000 within three or four weeks. In this way we obtain and keep a deep erythema of the skin and this is followed by desquammation of the epidermis. We must, of course, use more radiation in an advanced case than in an early case. This is a matter chiefly of clinical judgment. We aim to give the radium treatment which we can plan in advance during a period of from three to four weeks. During this period we give from 1,000 to 3,000 mg. hours on the inside of the mouth and we interpose these local treatments between the periods when the radium packs are being used.

For applications inside the mouth, one must improvise appliances continually to suit the individual case, so arranged that they will direct the radiation to the best advantage into the diseased tissues and at the same time protect the healthy tissue. Ready made equipment will not meet the variable needs. For this purpose, we use curved metal tubes to hold capsules against the pharynx, tonsil and posterior surface of the tongue. At times one can use a tonsil clamp. Lead of one-eighth inch thickness can be cut and bent into the form of clasps, as recommended by Grier,[7] to hold the radium in place, or dental compound may be used to make molds, as recommended by Edling.[8] Skill in the making of the applications is an important factor in the ultimate success. In all instances, the radium capsules and metal holders used inside the mouth must be protected by rubber or damage will be done by the secondary radiation from the metal. For this purpose we have found vulcanizing rubber to be the most practical and the most easily managed. We have been using this for about twelve years. We do not know of its having been mentioned previously.

Cancer of the mouth cannot be treated by rule. Each case is an individual problem. In the scientific exhibit we shave shown examples of our methods and of the results obtained, but no two cases are alike and no two are treated alike.

Our best results have been obtained by surface applications on the inside as well as on the outside; but when the disease is of long duration or when there have been previous treatments and scar tissue formation, the induration does not always disappear, and one cannot be satisfied until it has disappeared. After preliminary irradiation we sometimes remove these areas by electrothermic methods, or we insert radium needles, or it may be well to do a local excision.

When we use radium needles, we prefer iridioplatinum of the filter value equivalent to 1 mm. of lead. We at times use 10 mg. needles or 5 mg. needles with half this filter value. These are left in place from six to twelve hours; but when steel needles (0.4 mm. walls) are used they cannot be left in place more than from three to five hours unless a local necrosis is desired. With needles and with electrocoagulation we sometimes get troublesome sloughing. We make it a rule to apply surface applications, at least by packs, within a week after the needling, because of the associated congestion which follows needling and which may favor growth by increasing the blood supply to any cancer cells that may have been left living.

7. Grier, G. W.: The Treatment of Malignant Diseases in the Mouth, Am. J. Roentgenol. **12**: 347-352 (Oct.) 1924.
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RESULTS OF PURE GAMMA RADIATION

As a result of the application of radium element applied locally in the mouth, with a filtration of at least 1 mm. of platinum and of 2 mm. when the space will permit (which eliminates about 14 per cent of the softer gamma rays) we may expect a disappearance of the local growth in nearly all instances. This effect has the following requirements:

1. The lesion must be attacked from as many angles as possible and at a distance of from 3 to 6 mm.
2. The effect must be continued over a period of about three weeks.
3. It is carried to the extent of making the local mucous membrane white, and at times to desquamate.
4. The normal tissue must be protected as much as possible by 3 mm. of lead covered with rubber.

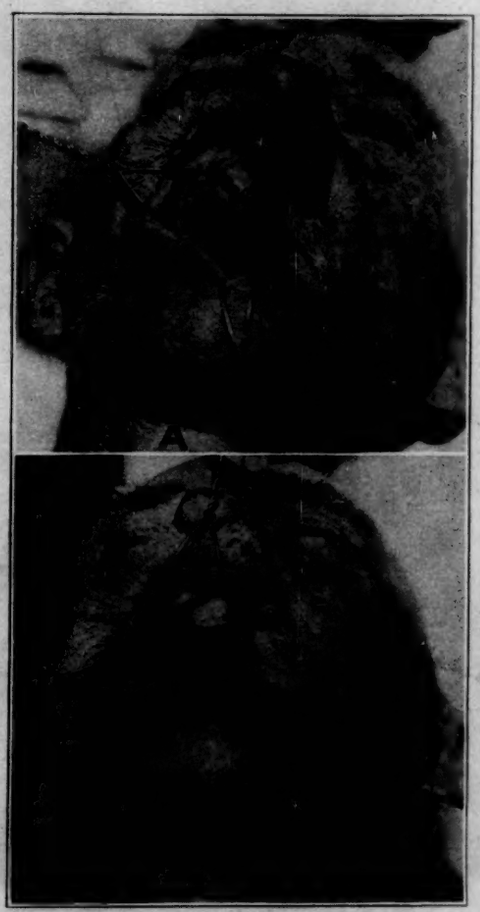

Fig. 3 (case 2).—H. W., a man, aged 64, referred by Dr. J. Fred Wagner, Nov. 24, 1924, with carcinoma involving the entire right upper alveolar process, with destruction of the floor of the antrum: *A*, before treatment; *B*, showing the lesion entirely healed by irradiation, May 15, 1925. The patient is still well.

5. When there has been previous treatment and much fibrous or scar tissue, the area must be excised (after preliminary irradiation) or radium needles must be inserted. Such hard or fibrous lesions never give as satisfactory results as a recent or untreated case.

Epithelioma developing on the basis of leukoplakia may have to be destroyed by electrocoagulation. In leukoplakia, other lesions are likely to develop at some other part of the mouth long after the original lesion has been well. Such lesions have all the appearances of new lesions but because of previous irradiation are more radio resistant; therefore a case of leukoplakia must be kept under observation, and in all cancers of the mouth tobacco in any form should be prohibited.

In cancers of the mouth treated in this manner there is never any mutilation or destruction of the tissues other than what was destroyed by the cancer.

Dryness of the mouth is a common result of the heavy external irradiation in some of the cases, but this symptom usually disappears after several months, as the salivary glands recover.

We have treated by this method during the past six years 111 cases of intra-oral cancer. This analysis includes only intra-oral cases treated since May 1, 1924. It does not include cancer of the lip or those intra-oral cases treated by other methods before or during the early development of this technic. During this time our technic has been gradually developed and therefore in the earlier cases we think the results were not as good as those treated more recently, so far as one

Fig. 4 (case 2).—Condition of antrum: *A*, Nov. 24, 1924, showing complete destruction of the floor of the antrum on the right side, to be compared with the healthy antrum on the left; *B*, showing the patient still well, April 23, 1930, with the reformation of the floor of the right antrum.

can judge by the primary healing. We have gradually increased our total quantity of irradiation. By this method we have treated 111 patients. Of these, thirty-nine have become symptom free and are at present apparently well after a period of from one to five years; and nineteen are still under treatment and expected to recover. Treatment was interrupted in four patients; five patients cannot be traced, and forty-four are dead. It is our impression that 50 per cent of the patients with cancer of the mouth should recover if treated at once, thoroughly and skilfully by this method as soon as they come under the care of a physician, and 75 per cent should recover when patients can be taught to apply for treatment earlier.

A record of the thirty-nine symptom-free cases is as follows: less than one year, 4 cases; from one to two years, 11 cases; from two to three years, 8 cases; from three to four years, 5 cases; from four to five years, 4 cases; from five to six years, 7 cases.

Our records contain many advanced cases. In eighty-two of these patients there were palpable lymph nodes. No one can be certain that palpable lymph nodes are malignant, but certainly from a clinical standpoint they must be regarded as malignant for the sake of proper treatment.

Surgical dissections show from 12 to 20 per cent to be nonmalignant. Of the eighty-two patients with palpable lymph nodes, twenty-three have recovered, nine are under treatment, forty-four are dead, three cannot be traced, and three discontinued treatment. This shows a proportion (28 per cent) of recoveries with glandular involvement that is probably equal to the results obtained by block dissection and with less suffering on the part of the patient and less interference with the radiation treatment.

We have had twenty-three patients in whom the cancer had extended into the neighboring bone. Of these patients, nine have recovered (39 per cent), three are under treatment, one cannot be traced, nine are dead and one discontinued treatment. This has seemed to us most remarkable. We believe that if the involvement is extensive, this cannot be expected. Three cases with bone involvement were also demonstrated to us as healed by Gendreau of Montreal.

ADVANTAGES OF PURE GAMMA RADIATION TREATMENT

The advantages of pure gamma radiation treatment are as follows:

1. It is painless at the time of application, though it causes soreness and swelling in the mouth at the height of the radiation effect.
2. It does not require an anesthetic.
3. It does not require hospitalization.
4. It does not produce mutilation.
5. It usually does not produce constitutional symptoms.
6. The skin effects, when carefully managed as directed, are of no consequence.
7. In tongue cases, the function of the tongue is preserved.
8. It usually causes the disappearance of metastatic lymph nodes. When these are sluggish, we sometimes insert radium needles into the lymph node. If the glands break down they are removed surgically.

DISADVANTAGES OF PURE GAMMA RADIATION TREATMENT

The disadvantages of pure gamma radiation treatment are as follows:

1. It is exceedingly expensive, because one is only using a small portion of the total radiation.
2. It is not very practical to hire radium because one must pay while it is in transit.
3. A considerable quantity of radium must be available if one is treating a number of patients, and any one who treats only a few patients generally lacks experience.
4. It interferes with the occupation of the patient during a period of at least a month.
5. It requires the constant or daily supervision of the experienced radiologist and cannot be turned over to technicians.

6. It requires the constant cooperation of the patient, which may be difficult to obtain.

7. The prolonged treatment that is necessary may be interrupted by ignorant patients who do not appreciate the seriousness of the disease or who consider themselves well prematurely.

8. The greatest possible precautions against undue personal exposure must be taken by the radiologist and the technician because of the large amounts of radium that must be used.

ASSOCIATED TREATMENT

1. All use of tobacco must be prohibited.

2. A roentgen examination should be made of all the teeth and of the alveolar process.

3. All diseased teeth should be removed, either at the beginning or as soon as sufficient radiation has been given to devitalize the cancer cells so that they will not be extended by the traumatism.

4. The mouth should be cleansed and kept clean. This will require much care and gentleness.

5. There should be a complete blood count made at the beginning and repeated from time to time during the treatment. If the patients are anemic, appropriate treatment must be instituted.

6. A Wassermann test should be made in most cases, for a large percentage of cancers of the mouth develop on old syphilitic lesions. Therefore, the presence of a positive Wassermann test does not eliminate the diagnosis of cancer and should not delay the treatment. Likewise, a microscopic diagnosis of cancer does not eliminate the possibility of associated syphilis. Both a microscopic diagnosis and a Wassermann test are usually advisable in each case.

7. When a section is taken for a microscopic examination, radiation treatment should be used either before or immediately afterward and should be continued until the lesion is proved not to be a cancer, or until sufficient radiation has been used to cure the cancer. The fact that one considers a section necessary shows that cancer is a possibility. Under such management, with immediate associated irradiation, we have never seen any bad effects from doing a biopsy.

8. The nourishment of these patients must be carefully provided for; otherwise they are likely to avoid food and lower their vitality.

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ABSTRACT OF DISCUSSION

DR. GEORGE W. GRIER, Pittsburgh: I hope the significance of this presentation is impressed on the audience. I take it that the manner in which radium is applied is of more importance than the mere fact of treating some disease with radium. Those who use radium perhaps forget this and others perhaps fail to realize this point at all. The technic of radium treatment must be learned. If one will duplicate the results of the authors he must learn how to do it. I felt for many years that the surface application of radium in the mouth was the preferable method of treatment to interstitial irradiation. I am glad to see that Drs. Pfahler and Vastine more or less corroborate my belief in this respect. All know the drawbacks to interstitial irradiation in the mouth and certainly the average radiologist will stand a much better chance of curing a larger percentage of cases if he tries to perfect himself in the technic of surface application than he will by the use of implants. There are circumstances, of course, in which surface application is impossible, but wherever it is possible it seems to me the chance of recovery is greater. I decide whether I shall use surface application or implants by the fact as to whether it seems possible to keep the radium in its proper location for a sufficient length of time to give the full dose. If that can't be done, of course it is useless to attempt the surface application. Undoubtedly a great part of the unusual results shown by the authors are due to an added method of treatment and that is external application of large doses of radium. This, I think, is new to most of us. Certainly the results shown here and the treatment of metastases open up a large field for thought. It has been my experience, as a rule, that when patients with carcinoma in the mouth develop large visible cervical glands the case is practically hopeless, and yet the authors have shown several cases in which these metastases have disappeared entirely. Any method of treatment that will allow of such results is certainly a great advance. Surgery is not the final and ideal method for the treatment of cervical metastasis, that is sure. It looks as if here was a method which will increase the number of cures.

DR. J. E. GENDREAU, Montreal: This method can give very good results, not only in that special part of the body but in other parts. For instance, if one wants to introduce into the axilla a great amount of radiation through external agents, radium or x-rays, heavy filtration must be used. If only one or two erythema skin doses per port of entry can be given, much of that radiation will not be sent deeply; but if as much as five erythema skin doses per field through a heavy filter can be used, there will be much more in the axilla. It is just the same for radium. When about 50,000 millicurie hours is given, a very thick filter must be used to avoid producing skin lesions. I have been following the method for many years and I had the privilege of showing it to Dr. Ernst and Dr. Pfahler in Montreal in three cases of cancer of the floor of the mouth with invasion of the bone and metastasis, that had been apparently cured for many years. These cases had been treated by surface applications only inside and outside the mouth and the result was a complete disappearance of the nodes and of the tumor in the mouth. It would have been difficult to obtain the same results with low filtration. I never had, though, the wonderful results that the authors have shown in the reconstruction of the invaded bone itself; in many cases I had destruction.

DR. GEORGE E. PFAHLER, Philadelphia: We have no rule that we can lay down for the treatment of cancer of the mouth. Every case must be individualized and the treatment must be adapted to the individual case. We do use interstitial radiation, but we do not usually begin with interstitial radiation. We use a surface radiation and when we get to a standstill in a lymph node, for example, or an induration remaining in the tongue, we insert radium needles to get some additional help. But it is my opinion that whenever interstitial radiation is used we should add surface radiation for the congestion that is set up by the interstitial radiation at a distant point where cancer cells may still be viable. Those cells may be stimulated to grow unless one adds some surface radiation.

Expert Witnesses.—Just as we have in the practice of medicine the so-called general practitioner, who must study and treat all types of disease and conditions presented to him, so we have had, in times passed, in the field of legal medicine those who attempted to qualify as advisers of the court in the elucidation of problems of widely varying character. However, the advances in the field of scientific medicine have been so marked in recent years that no single mind is able to carry the details of all of the many branches. The questions presented for solution in courts of law are so intricate, oftentimes, that it is not to be expected that any but carefully trained pathologists, neurologists, alienists, surgeons, obstetricians, chemists and other specialists would be in a position to act as real judicial advisers. In many cases the aid of several experts must be invoked, as the questions involved may necessitate a comprehensive knowledge of different fields. Hence, the courts demand that only those especially qualified by experience and special study along definite lines shall be called upon to aid in the clearing up of problems presented for solution. Such witnesses or advisers are known as "expert witnesses" and are asked to testify as to their opinions or as to the facts based on their special examinations of the case, or as to the deductions to be made from the facts set before the court by other witnesses.—Webster, R. W.: Legal Medicine and Toxicology, Philadelphia, W. B. Saunders Company, 1930.

REMOVABLE INTERNAL FIXATION IN FRACTURES *

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AND
P. M. GIRARD, M.D.
DALLAS, TEXAS

An analysis of the fracture problem by committees making careful surveys in large groups of cases, during the past few years, has served to establish certain definite principles that must be followed, though methods for carrying out these principles will differ with surgeons according to their training and equipment. The final result, a return to function, may be equally good with widely variant methods.

In appraising a fracture one must see more than a broken bone. The ultimate goal, return to function, depends on the recovery of muscles and ligaments as well, for bones may unite in good position after rough handling, but the damage in soft tissue may be irreparable. A trained surgeon with the right conception of the problem will be able to reduce most fractures by manipulation or traction and direct the subsequent treatment for the patient's final recovery. It should therefore be the aim of the orthopedic surgeon to perfect the technic of closed reductions. This will result in the successful treatment of many fractures that would come to open operation under less skilful care.

Under ideal conditions, however, there are some fractures that can be treated more successfully by internal fixation of the fragments, and the surgeon should be prepared to follow this method when indicated. Additional equipment necessary is knowledge of bone

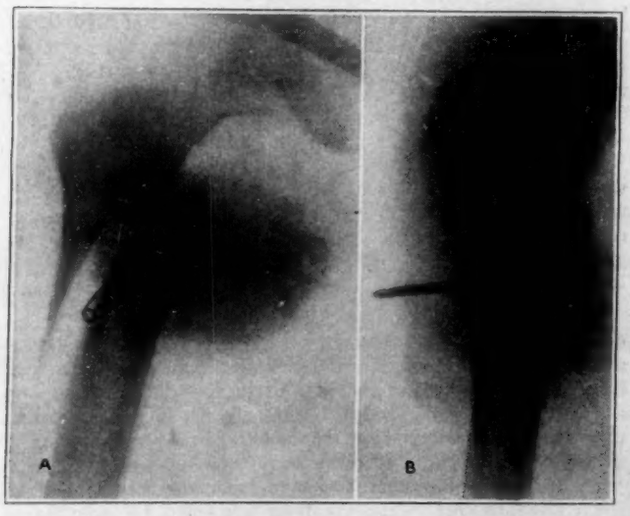

Fig. 1.—*A*, fracture of upper third of the femur; *B*, held by removable screw.

surgery and adequately trained assistants who can carry out a scrupulous technic in the operating room. The average technic used in abdominal surgery would be disastrous if it should be followed in a series of bone cases.

With the background of good mechanical sense and familiarity with the principles of splinting and training in bone surgery, one may consider open operation in fractures of the following groups:

1. Certain fractures about joints when muscle contraction prevents approximation by the closed method. Transverse fractures of the olecranon and patella are instances.
2. Fractures extending into weight-bearing joints with resulting uneven surfaces opposed.
3. Nonunion.
4. Malunion, when sufficient deformity is present to interfere with function.
5. Recent fractures, after failure by well planned closed methods.

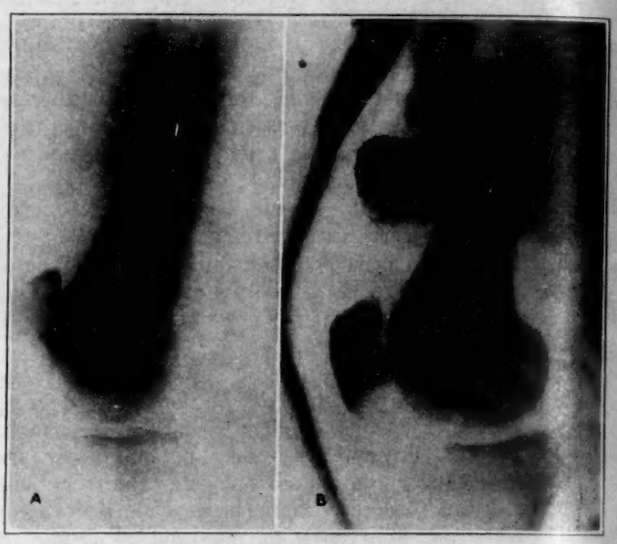

Fig. 2.—*A*, fracture of lower third of the femur; *B*, fragments held by staple.

As there are different plans for successfully reducing or splinting fractures, there are likewise different methods for fixing them in operative work, with equally good results. Removable internal fixation, an old principle practiced by Allen, Thompson and others, has merit in selected cases. It is our purpose in this paper to suggest some modifications to the method which makes it applicable to a wider range of conditions. It does not meet every demand for an ideal fixation device; neither do other instruments in general use. This fixation is not rigid, unless combined with plaster, and therefore it is difficult to get early motion in the adjacent joint. The pin projects through the skin and may favor infection. From our experience, however, this danger is not warranted.

In a limited number, but including several varieties of fractures, we have found that fixation is adequate, and, by hinging the plaster at the joint, motion may be instituted immediately after operation. With external fixation in plaster, the pin has a distinct advantage in controlling completely the tendency for angulation due to the contraction of muscles. This is observed regularly in the middle and upper third of the femur. The method is so easily and quickly applied that it changes a rather major operation to one of less exposure, less trauma and, therefore, within the sphere of a greater number of surgeons.

Depending on the type of fracture, three different devices have been used. For oblique fractures in the long bones and T-fractures in the joint, as the lower end of the humerus, femur or tibia, the screw is well adapted. It is made of stainless steel with a drill point and matching thread and is provided with an ordinary nut, which is tightened after the screw has firmly engaged the distal fragment. We have tried making a

* Read before the Section on Orthopedic Surgery at the Eighty-First Annual Session of the American Medical Association, June 26, 1930.

* Owing to lack of space, this article is abbreviated in THE JOURNAL by the omission of several illustrations. The complete article appears in the authors' reprints.

shoulder instead of a nut, but rejected it, because of the uncertainty in having a perfect fit for the case at hand. A sleeve placed over the screw and the nut outside, forcing the sleeve against the near fragment, was tried but found to be more cumbersome and less effective.

For application of the screw shown in the accompanying illustrations, the bones are approximated and held with a small narrow clamp. Two carpenter hand drills are provided. One drill, slightly larger than the screw, is placed obliquely through the nearer fragment. The other, smaller than the screw, is passed through the distal fragment. The screw, held in the chuck of one of the hand drills, engages firmly in the distal fragment and the nuts are then screwed tight with pliers against the nearer fragment. The screw is set obliquely so that the lines of stress may cross the screw instead of running parallel with it. In the latter position, the threads would receive all the strain and be less stable. The incision is completely closed and the screw extends about half an inch beyond the snugly applied dressings. Two light splints of plaster are added and applied evenly over the distance of the fractured bone but not including either joint. One of the splints incorporates the screw, and the two are bandaged securely and permitted to set. These inside splints fix the screw and because of their accurate fit do not permit movement of it, as would be present in a large plaster including the pelvis and entire leg. The outside plaster may be hinged at the elbow or knee for early motion. The screw should be left from three to four weeks and can be removed easily without pain. A pressure pad should be substituted in the case of a fractured femur.

In transverse or slightly oblique fractures, with insecurity after reductions, the two pronged fork may work admirably. After reduction, the bones are held with forceps on each fragment, and the fork is driven through the cortex as one would hammer a nail. It is important that the holes should be started with a drill, otherwise a fragment may split out and defeat the purpose. The pin emerges through the dressing and is

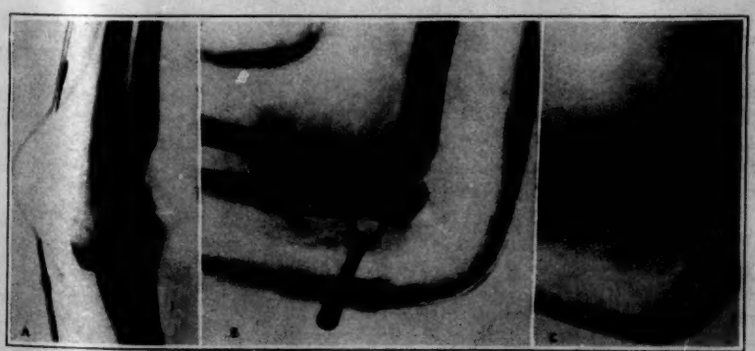

Fig. 3.—*A*, fractured olecranon of four days' duration; *B*, fragments held in apposition with elbow at right angle position by removable staple; *C*, another similar fracture held by removable screw.

fastened to the plaster in the same manner as described for the screw. It is obviously less secure, but meets every requirement in some cases, and is even more quickly and easily applied. The third device is, in principle, a miniature bone clamp. Two spurs are made on the end of a steel tube and through the tube a threaded bar is split at one end to form the two arms of a clamp and, when tightened by a nut on the outside, effects a permanent grasp on the bone. This instrument was designated especially for compound fractures and, even though bulky, can be removed through the open wound. On splitting the bar completely, it may be removed in sections and used on a simple fracture with easy removal.

These simple devices have been of greater value in fractures of two or three weeks' duration when manipulations and imperfect traction have failed to secure a satisfactory position. The argument might be made that good early treatment would prevent such conditions, but the facts are that consulting fracture surgeons will continue to see them and will wisely elect to open some rather than risk further trauma in late manipulation or

Fig. 4.—*A*, nonunion (nine months) in fractured humerus; *B*, union four months later. Osteoperiosteal bone graft and screw.

vainless traction. The method has been used several times in cases of nonunion. The fragments were freshened and fixed securely with a screw, after which osteoperiosteal grafts were placed in the usual manner. Figure 6 is a nonunion of the femur of eighteen months' duration, in the case of a healthy man, aged 23. The screw and periosteal grafts were used and consolidation was complete in four months.

The choice of bone graft operations is not under discussion, but those who prefer osteoperiosteal grafts will find temporary fixation one of the factors in preventing failure by the method. The most definite indication for the screw fixation is in joint fractures with widening of the articular surface.

Figure 7 is a fractured humerus with good traction for three weeks without reduction. The deformity was reduced to a hair-line fracture by open operation, and fixation was so complete by use of a screw that motion was immediately instituted and recovery was complete in three months.

The plan of removable fixation is not proposed to meet all requirements in an operation in fractures, but in selected cases we have found it adequate, easily applied and worth a place in the armamentarium of the fracture surgeon.

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ABSTRACT OF DISCUSSION

DR. ROBERT D. SCHROCK, Omaha: The procedure of Drs. Carrell and Girard I believe to be a very kindly one. Their emphasis, however, on the introduction of the minimum amount of foreign material to obtain fixation I believe should be urged just a little bit further. Their ideas are so much in agreement with my own practice that I cannot find sufficient points of

difference to present a desirable opposition to the ideas presented. The minimum amount of foreign material introduced adds to safety in the necessary open reduction. I think the authors did not stress in their discussion the added necessity of adequate external fixation as well. More than that, in the femur, with the minimum internal fixation, the essential fixture is traction efficiently applied in order to prevent the external bowing of that femur, particularly in the middle third. I should like to have the authors tell something of the difficulty of removal of the screw, particularly with the nut on it. It seems to me that there will be a little difficulty in removing that without local

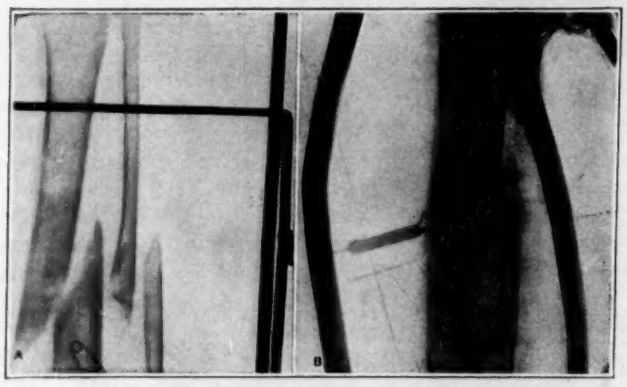

Fig. 5.—*A*, compound fracture; *B*, removable clamp holding fragments. The iron bars connect the foot and knee casts, allowing for dressing of wound and firm fixation. Union three months later.

anesthesia. I have been using little pins for internal fixation of fractures, devised by Dr. John P. Lord. They are made of diamond point wire. A machine drill is used for making the hole, the diamond point being too short to cut the hard cortex of bone. The removal of the drills is the easiest part of the procedure. At the end of about the third week, they can be pulled out with dressing forceps without pain. The drills are made in various sizes to meet the indications. I have been using phonograph needles for the small metacarpal fractures, but this type of drill is sufficiently heavy to hold femurs.

DR. HARRY E. MOCK, Chicago: The minimum amount of foreign material should be used in any of these open reduction cases, and preference given to external fixation whenever possible. Each year I am reducing the percentage of open operations for recent fractures, more and more. I now operate in only 2 per cent of early fractures. I long ago abandoned the Lane plate. The various fixation screws shown by the authors are very ingenious. These screws give the minimum amount of foreign material for fixation, but there is the same danger of osteoporosis around the site of application of the screw and therefore do add a certain amount to the danger of infection and of nonunion. I get a great many cases of reconstructive surgery. This last year I have had two cases of markedly deformed elbow joints, the result of fractures of the lower end of the humerus in which screws were applied as a method of fixation without putting on a Lane plate. Every year brings forth a certain number of examples of worse deformities and more prolonged disabilities, the result of attempted open reduction and fixation of fractured fragments than could possibly have resulted from even a poorly closed reduction of the original fracture. I doubt the advisability of advocating to the rank and file of the profession the use of foreign material in fixation of fractures. Papers on technic for open reduction should always emphasize the fact that only a very small percentage of fractures require open reduction.

DR. JOSEPH E. WHEELER, Jefferson Barracks, Mo.: Ordinarily such methods are used in the treatment of fractures as traction, manipulation, external fixation and countertraction, but in some fractures, oblique or spiral, or those near the joint extending into the articular surfaces of the joint, it is necessary to use some internal splinting. These splints are of two kinds, absorbable and nonabsorbable. The nonabsorbable material is stronger and where there is any great stress, the nonabsorbable is usually employed. The disadvantage in the nonabsorbable is that if it is left in too long it will cause irritative changes in the bone. These nonabsorbable materials usually should be removed within a period of from three to six weeks. The method of Drs. Carrell and Girard apparently has these advantages over those previously advanced: it is easier to apply, the fixation is stronger and it is easier to remove. The disadvantage may be that they failed to stress the necessity of external splinting. In all these cases of splinting internally, they must also be well fixed on the outside.

DR. ALFRED J. BUKA, Pittsburgh: Drs. Carrell and Girard have shown that foreign material, especially metal, has no business generally to remain in fracture sites ad infinitum. I think the idea of removing such splints is right and that leaving them at a fracture site for an indefinite period is out of place and often dangerous. Any one doing reconstruction and fracture work has found it necessary from time to time to take out some of this hardware. I feel that setting out with a plan for a definite time of removal of metallic substances put in a fracture site for fixation is more valuable than anything pertaining to their use.

DR. S. C. WOLDENBERG, Chicago: If a patient is subjected to an open operation for reducing fractures, and an osteoperiosteal graft is done, it should not be necessary to put in any external material, as staples or anything else. If the plaster cast, or splint, or whatever external support is used is applied adequately and has the right kind of assistance, it should not be necessary to put in any foreign material. I don't know why there is so much objection to putting in an ordinary staple when the fracture is opened and the ends are brought together. I do not have to take them out if they are put in properly. In more than a hundred cases I have not had to remove more than two or three staples and they were all at the anterior portion in the middle third of the tibia. They were superficial and both cases were old. One thing that is most important is the necessity of not repeating manipulations in trying to bring the ends together and not doing any open operation with the hope that union will result.

DR. WALTER G. STERN, Cleveland: Being the only one in my memory who has ever come before this section to read a paper on the nonoperative treatment of compound fractures, I

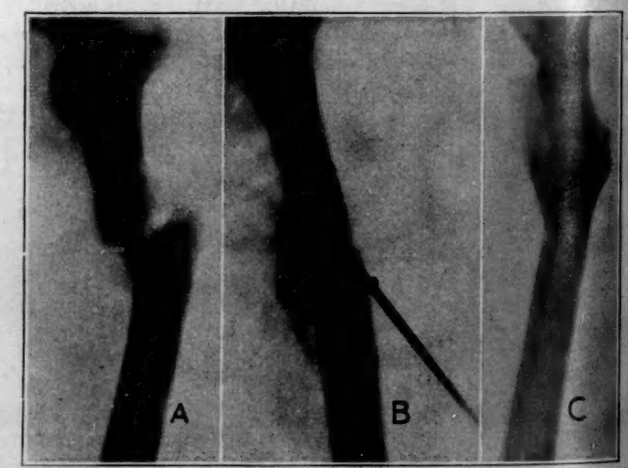

Fig. 6 (Captain H.).—*A*, nonunion of femur of eighteen months' duration; *B*, open reduction fixation by removable screw plus periosteal bone graft; *C*, good union in four months.

cannot help but warn you of tempting the medical profession in general with the assuring principle that it is safe to operate immediately on the bones of a compound fracture for the purpose of correcting the deformity. I am sure a skilful technic will permit a trained operator to put in staples or to use the ingenious combination of nut and bolt that has been shown here, but I do not think the method should be spread broadcast in a medical journal, so that the ordinary rank and file of the men treating fractures will think that they can operate on the bones of compound fractures and put in metal devices and get away with it; because in my experience in my neck of the woods it can't be

done. The great danger in compound fracture is not nonunion or malposition; it is infection, and when foreign material is put in or operation is done on the bones of a compound fracture—the resistance of which is already weakened by the trauma—nothing is added to the ability to resist infection. The first thing one must do in a compound fracture is to overcome the ever present danger of infection and if after eight or ten days this danger of infection is over, one must let his conscience be his guide; but the infection should be overcome first. Drs. Carrell and Girard have shown in certain of their cases that even after two or three weeks they have been able to reduce the fracture, hold it with their ingenious staple and get union; so one need not be afraid of waiting eight, ten or fourteen days for the danger of infection of the compound fracture to be overcome before performing any operation or extensive manipulations.

DR. W. B. CARRELL, Dallas, Texas: Dr. Stern's remarks are pertinent to a discussion on open operation in compound fractures. I shall not argue this point, but for those who believe the potential factors for infection in some cases are so great that conservative treatment is dangerous, this miniature bone clamp, following débridement of the wound, serves the excellent purpose of holding the fragments in position without penetrating

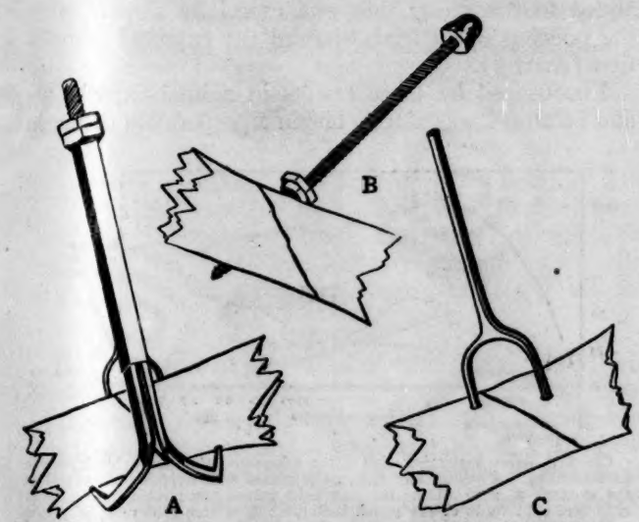

Fig. 12.—*A*, removable clamp particularly adapted to compound fractures; in three pieces not including two nuts. *B*, removable screw for internal fixation. *C*, removable staple for internal fixation.

the bone or in any way interfering with subsequent treatment by surgical solution of chlorinated soda or petrolatum packs. Notching the fragments will in many cases be adequate. Displacement is more likely to occur during application of plaster, and delayed closure would certainly minimize this misfortune. The method, however, generally applied, seems fraught with possible danger of a break in surgical technic. With regard to difficulties in removing the screw, attention is directed to the type of nut with the external surface rounded to permit less friction when backing through the soft tissues. Removal is quite easy and has not been complained of by the patient. The staple is slightly more difficult and the removal can be facilitated by making the skin opening long enough to permit undue tension.

Arthritis Without Bacteria in Joints.—Frieberg has shown that arthritis can occur without bacteria entering the joints and was able to produce cartilage destruction, proliferation of the synovial membrane and new bone formation in rabbits by injecting intra-articularly the sterile filtrate from a strain of Flexner's dysentery bacillus. As control fluids he used salt solution, horse serum and dilute lactic acid, which on injection did not produce a similar arthritis. These researches may possibly supply one plank in bridging over the gap between the infective and noninfective theories, for if sterile filtrates of bacteria can produce the lesions of arthritis deformans, toxic bodies resulting from metabolic disturbances may also be capable of setting up similar changes.—Poynton, F. J., and Schlesinger, B.: Recent Advances in the Study of Rheumatism, Philadelphia: P. Blakiston's Son & Co., 1931.

THE TREATMENT OF PEPTIC ULCER WITH GASTRIC MUCIN

PRELIMINARY REPORT *

SAMUEL J. FOGELSON, M.D.
CHICAGO

The ideal therapeutic agent for use in combating the irritative action of gastric juice in peptic ulcer is one that will neutralize or combine with the acid without materially stimulating or depressing gastric secretion, without materially affecting gastro-intestinal activity, and without having a general systemic action. Although alkaline powders have been and are being used in the treatment of peptic ulcer, it is well known that they are not ideal.

In the literature on gastric secretion, the capacity of mucus to lower the free acid in the stomach is repeatedly suggested. In 1879 Heidenhein believed that mucus was alkaline and later Pavlov [1] suggested that it was the mucus which lowered the free acidity of the stomach by neutralization. Ivy [2] made pouches of the pyloric antrum in dogs and found the secretion of these pouches to be "mucoid, viscous, tenacious, transparent, odorless and slightly salty. It resembled egg white in appearance and consistency, was slightly alkaline with a p_H of 7.0 to 7.5 and neutral to litmus." Lim,[3] in an exhaustive article on the relationship between gastric secretion and basal secretion of the stomach, states that: "it thus seems not unlikely that the colloid nature of mucus accounts (adsorption of alkali) for the titrable total acid found with the lowest secretory rates." He adds that "at lower secretion rates the concentration of mucus is unquestionably higher especially in the case of entire stomach juice, containing pyloric secretion which is continuous and little altered by secretory activity in the fundus."

These physiologic observations suggested gastric mucus as an ideal antacid in that (*a*) it combines readily with the free acid, (*b*) it is a natural substance which plays normally a protective, soothing and lubricating rôle in the functioning of mucous membranes, and (*c*) its secretion or ingestion causes no chemical disturbances in the body and no unfavorable effect on gastro-intestinal secretory or motor activity. To evaluate gastric mucus as an antacid, it was necessary either to stimulate the secretion of mucus by the gastric glands or to administer it by mouth. Increasing the bivalent anions in the circulation should stimulate secretion from the gastric mucous glands [4] but in these experiments on Pavlov pouch dogs no definite effect was discovered. The alternative procedure, then, was to prepare mucus from other sources and administer it orally to experimental animals and patients with the hope that the measurable free acid would in this way be definitely lowered and the lower secretion rates of Lim would be reproduced.

An ideal preparation of mucus would have the characteristics of the mucus that Ivy isolated in his experiments on the pyloric pouch. With the cooperation of Dr. Fred Fenger of the Armour & Co. Research

* From the Department of Experimental Surgery, Northwestern University Medical School.

1. Pavlov, I. P.: The Work of the Digestive Glands, Philadelphia, J. B. Lippincott Company, 1910.
2. Ivy, A. C., and Oyama, Yutaka: Am. J. Physiol. **57**: 51 (Aug.) 1921.
3. Lim, R. K. S.: Am. J. Physiol. **69**: 318 (July) 1924.
4. Babkin, B. P.: Die aussere Sekretion der Verdauungs Drusen, Berlin, Springer, 1928.

Laboratory in Organotherapeutics, mucin was prepared by precipitation from a dilute hydrochloric acid solution of gastric mucosa at a p_H of 4.5 after the addition of an equal volume of alcohol. When dried and neutralized to a p_H of 7.0, it is mucoid, viscous, readily soluble in acid and alkali, faintly soluble in water and has a high combining power. One gram of this powdered mucin combines with about 15 cc. of 0.5 per cent hydrochloric acid.

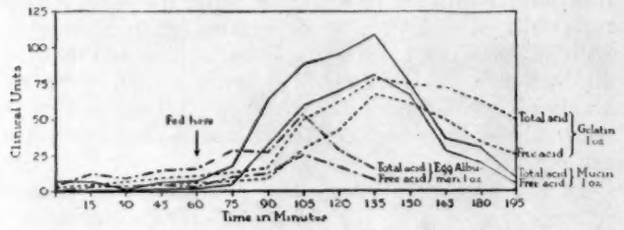

Chart 1.—Typical gastric analysis on feeding dogs 1 ounce of mucin, gelatin and egg albumin. From the free and total acid values shown here it is obvious that mucin as at present prepared is a slightly greater gastric stimulant than either egg albumin or gelatin.

On chemical analysis this powder was found to contain: moisture, 5 per cent; ash, 14.65 per cent; sodium chloride, 2.50 per cent; organic chlorine, none; total nitrogen, 9.93 per cent; phosphorus pentoxide, 4.45 per cent.

EXPERIMENTAL RESULTS

The mucin prepared from the hog's gastric mucosa and used in this experiment has a high combining power with free acid but does not depress gastric secretion. In fact, when equal quantities of this mucin in solution, egg albumin or gelatin, respectively, were put into the stomachs of Pavlov pouch dogs through a stomach tube, the mucin led to a slightly greater secretion of acid than either gelatin or egg albumin (chart 1). It is well known that both egg albumin and gelatin are weak excitants of the gastric glands and for this reason they were contrasted to the mucin. Our results show that the mucin as prepared at present is only a mild gastric secretory excitant. These experimental results have been confirmed by Drs. Ivy and Kim, who report the following from the hog gastric mucin with which I supplied them. "(1) The hog's gastric mucin used has a high combining power (1 Gm. combining with

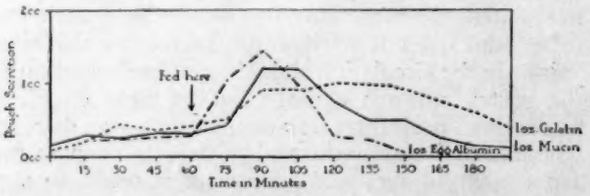

Chart 2.—This chart supplements chart 1 and demonstrates that our preparation of mucin, put in the stomachs of Pavlov pouch dogs, will lead to about the same quantity of "pouch" secretion as gelatin or egg albumin.

from 12 to 15 cc. of tenth normal hydrochloric acid); (2) it does not irritate the gastro-intestinal mucosa; (3) it mildly stimulates the gastric glands and in its present form it excites the gastric glands on being perfused through a pouch of the entire stomach, which proves that it contains secretagogues."

When 2 ounces of mucin, egg albumin, gelatin or meat, respectively, were introduced by stomach tube into the stomach of the Pavlov pouch dogs and the dogs were excited to secrete gastric juice at the beginning of the experiments by an adequate dose of histamine, it was noted that there was complete absence of free hydrochloric acid only in the stomachs containing the mucin, whereas the Pavlov pouch in all cases secreted the usual free acid. These results show that the mucin has a high combining power with free acid in vivo. Chart 3 shows a comparison of the free acid in the stomach when immediately after histamine stimulation 2 ounces of mucin, gelatin, or egg albumin and 4 ounces of meat, respectively, were put in the stomachs of Pavlov pouch dogs.

Of further interest were the results obtained from feeding Pavlov pouch dogs a pound of meat in which there was mixed half an ounce of powdered mucin. Meat itself, of course, has a high combining power, but in the controls that were fed meat alone some free acid was present in these dogs' stomachs throughout an observation period of from five to seven hours or until the stomachs were empty. But this free acid was absent in all cases when the half ounce of mucin was added to the meat; this was especially significant as the pouches in all trials showed the expected stimulation (chart 4).

Encouraged by these results in animal experiments and because I was able to obtain a preparation of mucin

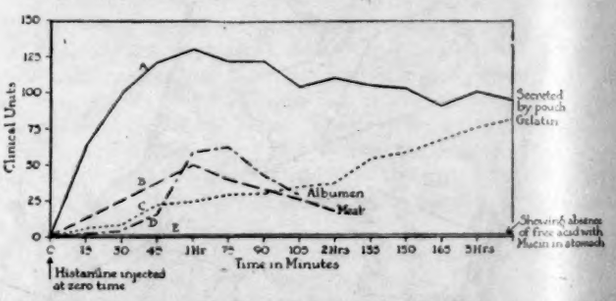

Chart 3.—Demonstrating that after adequate stimulation by histamine as shown by the pouch secretion, only mucin will keep the free acid in the stomach at zero. Only the free acid values are plotted in the chart; *A* is free acid value of the pouch secretion; *B* is free acid value of gastric contents with 4 ounces of meat in the stomach; *C* is free acid values of gastric contents with 2 ounces of gelatin in the stomach; *D* is free acid values of gastric contents with 2 ounces of egg albumin in the stomach; *E* shows absence of free acid with 2 ounces of mucin in the stomach.

free from intestinal parasites, ova and other objectionable features, I extended the experiments to cases of peptic ulcer in man.

CLINICAL RESULTS

Since January, 1930, twelve patients with typical ulcer histories were available. The roentgen appearances in ten of these were those usually interpreted as characteristic of duodenal ulcer. One of the remaining patients had a gastric resection and the other had a gastro-enterostomy. In both of these, pain after eating was the major complaint. The duration of symptoms varied from two to seven years and all of the patients had been on the usual alkalizing regimen together with the customary nonirritating diet with only temporary relief. One patient had marked retention after ten or twelve hours.

The general procedure was to give each patient an ounce of powdered mucin prepared as described with each meal and from 20 to 40 grains in tablet form either hourly or every half hour when the patient had severe pain or when the fractional Ewald test meal showed unusually high free acid. The ounce dose of mucin was not easy for the patients to take because of its viscous character; but Miss Tufts, the dietitian at Wesley Memorial Hospital, solved this problem by

incorporating it in ice cream or similar frozen foods, as well as in thick drinks such as malted milk. Further treatment consisted only of the usual bland, convalescent ulcer diet.

In all twelve patients the subjective symptoms disappeared within three days of treatment, the most gratifying feature being the persistent absence of pain, which did not recur despite two grave dietary indiscretions in two patients with alcoholic tendencies. The periods of observation have, however, been only from

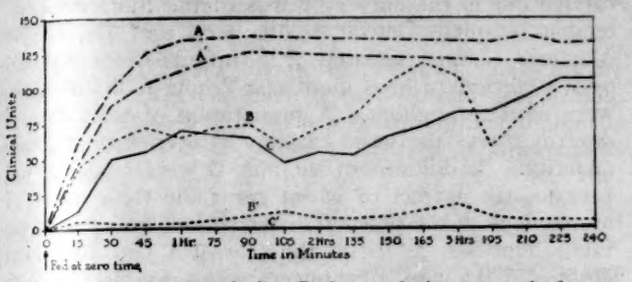

Chart 4.—This contrasts feeding Pavlov pouch dogs a pound of meat alone with a pound of meat mixed with half an ounce of mucin. There is no free acid in the stomach when the mucin is added, as shown by curve *C'*. *A*, total acid value of pouch secretion; *A'*, free acid value of pouch secretion; *B*, total acid value of gastric contents with meat feeding; *B'*, free acid value gastric contents with meat feeding; *C*, total acid value of gastric contents with meat plus mucin feeding; *C'*, absence of free acid in gastric contents with meat plus mucin feeding.

two to five months. The patient with retention now has a normal emptying time. As yet, difficulties have not been encountered from excessive quantities of mucus in the stools nor has any patient shown any ill effect from being fed such large quantities of mucin.

COMMENT

It is realized that periods of observation varying from two to five months cannot justify any thought of cure in this small series of twelve cases. But since mucin from a theoretical and experimental point of view proves to be practically ideal, an extensive clinical trial is indicated. The mechanism that afforded the relief from symptoms may be the combination of the free hydrochloric acid with the mucin, although another important factor is present that cannot be ignored. J. E. Whitlow,[5] studying the protective rôle of gastric mucus against the proteolytic action of gastric secretion, concluded:

1. Gastric mucus does delay and inhibit—though not prevent—the diffusion of hydrochloric acid and pepsin.
2. The rate of diffusion of hydrochloric acid through gastric mucus is inversely proportional to the depth of mucous layer and inversely proportional to increase in viscosity of the mucus; the diffusion of pepsin is directly proportional to the time required for the hydrochloric acid to diffuse through the entire depth of the mucous layer.
3. The presence of tenth normal hydrochloric acid in gastric mucus hastens the rate of diffusion of pepsin through a layer of mucus.
4. The fact that gastric mucus covers the mucous membrane of the stomach with a viscid, tenacious coat that retards digestion and diffusion of gastric juice as shown by in vitro experiments makes it impossible to deny the protective rôle of this secretion against autodigestion of the stomach.
5. The most direct evidence of all, however, is the fact that when the mucus is wiped away with a cotton swab and tenth normal hydrochloric acid or normal gastric juice is applied, bleeding occurs, and when merely swabbed with equal vigor and mechanical irritation, no bleeding occurs. It becomes a self evident fact, therefore, that mucus protects the gastric mucosa against the action of gastric juice.

5. Whitlow, J. E.: The Protective Action of Mucus, master's thesis, Loyola University (unpublished).

Similar results are reported by Klug[6] and it is highly probable that the relief from symptoms obtained from feeding the mucin preparation was secondary to two factors. First, the mucin coated the ulcer and protected it against the proteolytic action of the gastric secretion, and, second, through its high combining power with free acid it united with enough hydrochloric acid not only to neutralize the corrosive action of gastric juice but also to prolong the rate of dialysis of pepsin through the now present protective mucin layer. Obviously, both these factors would be important in affording relief from pain and in hastening healing.

SUMMARY

1. Gastric mucin prepared from hog's stomach is only a mild excitant of gastric secretion.
2. Gastric mucin has a high combining power. Two ounces of mucin placed in the stomach of the dog was more than sufficient to combine with the acid secreted in response to the injection of 1 mg. of histamine.
3. When half an ounce of mucin was mixed with a pound of meat and fed to a dog, free acid did not appear in the dog's stomach throughout the period of observation of from five to seven hours.
4. Complete relief from symptoms for varying periods of from two to five months was afforded to twelve patients with classic histories and roentgen appearances of peptic ulcer by feeding them about an ounce of hog's gastric mucin three times a day with their meals in addition to about 30 grains of mucin in tablet form hourly throughout the day.

25 East Washington Street.

6. Klug, F.: Arch. internat. de physiol. **5**: 297-317, 1907.

USE OF VITAMIN B IN DIETS OF INFANTS

FURTHER OBSERVATIONS *

B. RAYMOND HOOBLER, M.D.
DETROIT

Since my former report[1] there has been a prodigious amount of work done covering many phases of vitamin B. The chemical and biologic properties have received the greatest attention, as evidenced by the many reports of research that have been published. The problem seems to be world wide if one takes into account the geographic sources of these studies. The greater part of the work is still being done on animals, particularly on birds, a group that is most susceptible to this deficiency disease. The chemists also have been exceedingly busy in this field. I shall give a summary of the most recent observations of biologists and biochemists before proceeding to the original work with which this paper deals.

The most striking development in the studies of vitamin B is the discovery that there are several different factors in what was originally considered as vitamin B. Goldberger[2] has separated the pellagra-preventive factor and that portion is now known as vitamin G. The term vitamin B should be restricted to the antineuritic fraction. The separation of these two fractions

* Read before the American Pediatric Society, Montreal, June 17, 1930.

1. Hoobler, B. R.; Macy, Icie G., and Outhouse, Julia: Biological Characteristics of Human Milk, Tr. Am. Ped. Soc. **38**: 38, 1929.

2. Goldberger, Joseph; Wheeler, G. A., and Sebrell, W. H.: A Study of the Black Tongue Preventive Value of Leached Commercial Casein, Together with a Test of the Black Tongue Preventive Action of a High Protein Diet, Pub. Health Rep. **45**: 273 (Feb. 7) 1930.

is accomplished by heating, the antineuritic portion being heat labile and the pellagra-preventive being the heat stabile portion. Williams and Waterman [3] believe that a third portion, which is intimately connected with the processes of digestion, will also be separated. Until recently it was believed that the animal organism could not synthesize vitamin B, but recently Bechdel and his co-workers [4] demonstrated that this could be done in the rumen of cattle through bacterial action. This may lead to a new source of vitamin B. With the ability to separate at least two factors from the vitamin B complex, the analysis of various food products has become necessary; it is interesting to note that certain foods contain much more vitamin G and others much more of the antineuritic factor, so that a complete restatement of food values in these particulars is necessary.

Lactating animals have been shown to require from three to five times more vitamin B complex to maintain lactation than they need during nonlactating periods. There has been demonstrated a relationship existing between the basal food products and vitamin requirement. An important research conducted by Harris and Moore [5] showed that there exists a definite balance among vitamins E and G; by greatly increasing vitamins A and D in diets, an otherwise adequate amount of Vitamin B is made inadequate, leading to death of animals. One should be careful not to overdose with cod liver oil and viosterol unless at the same time an increasing quantity of vitamin B is also added to the diet.

Studies on the symptomatology and pathology of vitamin B deficiency have been largely confined to animal experimentation and but few clinical reports on infants have been published. Several valuable contributions, however, have been made, showing that definite cases of full-fledged beriberi exist in this country, by Dr. J. I. Waring [6] of Charleston, S. C., by Drs. Scott and Herrmann [7] of Louisiana, by Dr. Oscar Swineford, Jr.,[8] in Virginia, by Dr. L. S. Chapman [9] in Panama, and also by Dr. Sidney V. Haas [10] as occurring in New York.

It will be seen, then, that the disease is not confined to the tropics and therefore the symptomatology of evident beriberi should be constantly in mind in dealing with more or less obscure nutritional conditions here in North America. It is my conviction, however, that our infants are menaced by a partial lack of vitamin B rather than by a complete deficiency. The former condition is much more difficult to diagnose than outspoken beriberi, in which the symptomatology has been compiled by observers in Japan and the Philippines.

The signs shown by the infant whose diet is only partially deficient in vitamin B differ markedly from those of infantile beriberi and may range all the way from fretfulness and anorexia to noticeable loss of weight and rigidity. Contributions referring to partial deficiency have recently been made by Dennett,[11] Bloxsom,[12] West,[13] and Morgan and Barry.[14]

Both the contributions on true beriberi and on partial deficiencies of vitamin B in infants are most welcome at this time when so much material is coming from the laboratories, particularly since experimental beriberi in animals differs somewhat from the human type, as pointed out by Cowgill.[15]

The original work to be detailed in this paper was carried out in the nursery wards of the Florence Crittenden Hospital, Detroit, in the service of Dr. Edgar Martmer. Approximately 125 infants were studied over a period of five months. Whole milk dilutions were used throughout. A preparation of maltose and dextrin [16] was the basic carbohydrate used in suitable quantities. Additions of vitamin B were made in the form of the extract of wheat germ and the extract of brewers' yeast the potency of which had been tested on rats. This was added at the rate of 1 Gm. of wheat germ and 0.5 Gm. of brewers' yeast extract to each ounce of the preparation of maltose and dextrin used. The infants were kept on the basal ration (whole milk dilutions plus maltose and dextrin) for a two-week period. Records were kept of weight, total length, stem length, degree of spasticity, percentage of hemoglobin, appetite, and bowel conditions. At the end of this preliminary period the infants were kept on the same formulas and the wheat germ and yeast extracts were added in the proportions described and were continued for one month. Weights were taken weekly, but total and stem lengths were recorded only at the beginning and end of each period. The results are shown in the accompanying tables.

Table 1.—*Average Growth Monthly, Stem Length*

Breast fed	0.675 inch
Maltose and dextrin control	0.630 inch
Maltose and dextrin with vitamin B	0.735 inch

Table 1 takes into account growth in stem length. In taking both total and stem length, the methods used at the Merrill Palmer School were employed as described by Hejinian and Hatt.[17]

The maltose and dextrin preparation with vitamin B additions made the best showing, the breast-fed controls next, and the maltose and dextrin preparation the poorest.

Table 2.—*Average Growth Monthly, Total Length*

Breast fed	0.970 inch
Maltose and dextrin controls	0.818 inch
Maltose and dextrin with vitamin B	0.910 inch

Table 2 represents the total average growth during a twenty-eight day period. Breast-fed infants grew

3. Williams, R. R., and Waterman, R. E.: The Tripartite Nature of Vitamin B, J. Biol. Chem. **78:** 311 (July) 1928.
4. Bechdel, S. I.; Honeywell, H. E.; Dutcher, R. A., and Knutsen, M. H.: Synthesis of Vitamin B by the Bacteria in the Rumen of Cattle, J. Biol. Chem. **80:** 231-238 (Nov.) 1928.
5. Harris, L. J., and Moore, Thomas: Hypervitaminoses and Vitamin Balance: An Instance of Vitamin Balance, Biochem. J. **23:** 1114, 1929.
6. Waring, J. I.: Beriberi in Infants, Am. J. Dis. Child. **38:** 52-56 (July) 1929.
7. Scott, L. C., and Herrmann, George R.: Beriberi ("Maladie des Jambes") in Louisiana, J. A. M. A. **90:** 2083 (June 30) 1928.
8. Swineford, Oscar, Jr.: Beriberi in Virginia, Virginia M. Monthly **56:** 814-820 (March) 1930.
9. Chapman, L. S.: Beriberi in Panama, Proc. M. A. Isthmian Canal Zone **14:** 37-48, 1927.
10. Haas, S. V.: Beriberi in Late Infancy Result of Celiac Disease, Arch. Pediat. **46:** 467-478 (Aug.) 1929.
11. Dennett, R. H.: Routine Use of Vitamin B Factor in Infant Feeding, J. A. M. A. **92:** 769-772 (March 9) 1929.
12. Bloxsom, A. P.: Vitamin B Requirements in Infancy, Am. J. Dis. Child. **37:** 1161-1163 (June) 1929.
13. West, J. H.: Supplying the Breast Fed Baby with Vitamin B, Arch. Pediat. **46:** 646-650 (Oct.) 1929.
14. Morgan, Agnes F., and Barry, Margaret M.: Underweight Children: Increased Growth Secured Through Use of Wheat Germ, Am. J. Dis. Child. **39:** 935-947 (May) 1930.
15. Cowgill, G. R.: Some Physiological and Biochemical Aspects of Deficiencies with Special Reference to Vitamin B, Ann. Int. Med. **3:** 230-241 (Sept.) 1929.
16. The preparation used was Dextri-Maltose No. 2, Mead's.
17. Hejinian, Lucea; and Hatt, Elise: The Stem-Length Ratio as Index of Body Type in Young Children, Am. J. Phys. Anthropol. **13:** 287 (July-Sept.) 1929.

most; those fed with the maltose and dextrin preparation with vitamin B additions were a close second, while those given the maltose and dextrin preparation only showed considerably less growth.

TABLE 3.—*Average Daily Gains in Weight*

Breast fed controls (53 individual observation periods).....	0.816 ounce
Maltose and dextrin controls (124 individual observation periods: 98 per cent of breast, 96 per cent of breast and 98 per cent of maltose and dextrine control).....	0.801 ounce
Maltose and dextrin with extract of wheat germ and yeast (57 individual observation periods).....	0.788 ounce

In table 3 the gains in weight are practically the same on breast, the maltose and dextrin preparation, and the maltose and dextrin preparation plus vitamin B additions of a combination of extract of wheat germ and yeast.

TABLE 4.—*Average Daily Gains in Weight*

Food	Gain	Observation Periods	Per Cent of Breast Gain
Breast	0.893 ounce	5	
Maltose and dextrine plus extract of brewers' yeast, 0.5 Gm.	0.850 ounce	17	98
Maltose and dextrine plus extract of wheat germ, 1 Gm.	0.838 ounce	19	94
Maltose and dextrin only.....	0.793 ounce	12	89

In an attempt to determine which was the better, wheat germ or yeast extract, a study of fifty-seven infants during a period of two weeks was made (table 4). Again the variations in gain were so narrow that no definite conclusions could be drawn, but breast controls showed the highest average daily gain, the infants given yeast extract next, those given wheat germ held third place, and those fed the preparation of maltose and dextrin were in fourth place.

TABLE 5.—*Rigidity* *

Infant	Food	1st Mo.	2d Mo.	3d Mo.	4th Mo.	5th Mo.
Joanne D.....	Maltose and dextrin	3+	2+	2+	2+	2+
Gloria B.....	Maltose and dextrin plus vitamin B....	5+	3+	1+	1+	0
Leona.....	Maltose and dextrin	5+	4+	3+	2+	1+
Jean D.....	Maltose and dextrin	4+	...	3+	2+	0
Bernice M.....	Maltose and dextrin plus vitamin B....	...	4+	4+	4+	3+
Douglas E.....	Maltose and dextrin	4+	3+	2+	1+	0
David A.....	Maltose and dextrin plus vitamin B....	...	4+	3+	2+	1+
Edward J.....	Maltose and dextrin plus vitamin B....	4+	3+	2+	2+	2+
Russel.....	Maltose and dextrin plus vitamin B....	4+	4+	4+	4+	3+
Shirley M.....	Maltose and dextrin	4+	3+	1+	...	...
Robert H.....	Breast.....	5+	5+	2+	Brewers' yeast used	

* Twenty cases were noted but only those with marked spasticity graded from 3+ or more are given here.

Neither the preparation of maltose and dextrin nor the preparation with vitamin B additions was able to clear up the spasticity in certain cases. About 20 out of the 125 infants studied showed varying degrees of stiffness. I believe this to be about the ratio found in the usual hospital ward devoted to feeding cases. It was evident that ten of these twenty cases required more vitamin B than was contained in the additions supplied. It has been my experience that brewers' yeast concentrate or powdered yeast is a more effective way to supply the vitamin B complex, and this is borne out by the observations of Bloxsom.[12] It should be noted that one of the most marked instances of rigidity occurred in a breast-fed child. In 1926, in collaboration with Macy and Outhouse [1] I proved beyond question that human milk was relatively low in vitamin B content. How rapidly the rigidity cleared up under brewers' yeast concentrate is shown in the table.

CONCLUSIONS

1. Wheat germ and yeast in the form of dried powdered watery extracts when added in the proportions of 1 Gm. of wheat germ extract and 0.5 Gm. of yeast extract to 1 ounce of a preparation of maltose and dextrin and fed to infants caused no appreciable gain in weight over controls who were fed on similar formulas without vitamin B additions.

2. Infants given vitamin B additions showed a greater growth in recumbent and stem length than controls not given the vitamin B additions.

3. About one out of six of the infants studied showed symptoms of rigidity. This symptom disappeared in all but six of the cases, indicating that the quantity of vitamin B needed by infants differs greatly, and that one should bear in mind that while the amount of vitamin B in the commercial carbohydrate preparations may be sufficient for certain infants, there are others who will require larger quantities.

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ANTIVENIN THERAPEUSIS IN PURPURA *

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AND
GEORGE C. H. FRANKLIN, M.D.
ANCON, C. Z.

The following case report is submitted with the idea of stimulating further study in the use of antivenin in purpura:

A. P., a healthy white soldier, aged 23, for the past two years featherweight champion of the Canal Zone, was admitted to Gorgas Hospital, Dec. 30, 1929, for a submucous resection and tonsillectomy. His family history, previous personal history and complete physical examination were negative. His Wassermann reaction was negative and the coagulation time and urine were normal. This man, during his career as a fighter, had been struck on the nose many times and the bleeding that followed always ceased quickly. His left foot showed a small deep recent operative scar and he stated that the incision had healed rapidly and with but little bleeding.

December 31, a submucous resection under local anesthesia was performed. With the exception of the mechanical difficulties involved, due to the previous multiple fractures, the operation was uneventful. For twenty-four hours after the operation there was an excessive amount of bleeding and the petrolatum packing was left in situ for forty-eight hours, when its removal was followed by a severe hemorrhage. The usual local methods for the control of bleeding were employed, and in addition he was given 10 cc. of his own blood intramuscularly. Until Jan. 16, 1930, the patient was troubled with septal hematoma, subsequent abscess formation between flaps, periodic turbinal bleeding, and eventual sloughing of the septum. January 23, the patient developed an acute follicular tonsillitis with characteristic local and constitutional manifestations. He made a rapid recovery from this acute attack. As there had been no active bleeding since January 16, and the coagulation time was five minutes, a local tonsillectomy was performed, February 6. The operation was uneventful, there was no undue bleeding, and he left the operating room with dry fossae. Six hours after he had been returned to the ward from the operating room he developed a tremendous rapidly increasing extravasation of blood into his tongue and soft structures of his mouth and throat with such marked laryngeal involvement that it was necessary to perform a tracheotomy, February 7, twenty-

* From the Gorgas Hospital.

four hours after operation. At the time of the tracheotomy, bleeding was profuse—out of all proportion to the surgical procedure; however, this was controlled by ordinary surgical means. One hour after tracheotomy he had a series of profuse hemorrhages from the tracheotomy incision. In the fifteen minutes that elapsed before he was again prepared for operation, he went into marked shock, and fatal exsanguination was feared. The incision was opened and the bleeding finally controlled by numerous ties and sutures.

Decannulation was performed, February 11, four days after tracheotomy, the extravasation in the upper respiratory passages having been largely absorbed. He improved materially until February 22, when without apparent reason he had a profuse, alarming nasal hemorrhage which, despite all effort of control, lasted in varying degree until February 26.

The therapeutic agents that had been employed up to this time were as follows: intramuscular injection of the patient's own blood, calcium lactate, tincture of ferric chloride, intramuscular injection of horse serum, blood transfusion of 400 cc. of citrated blood on the morning of February 25, liver extract and careful dietetic supervision.

February 25, when the lobule of his ear was pricked for a blood platelet count, the puncture wound bled freely for twenty-four hours. It is interesting to note here that previous punctures of his finger tips had given no trouble.

There was no improvement after the blood transfusion, and the hemorrhage continued. The patient was then desensitized by being given two small intracutaneous doses of 0.1 and 0.2 cc. of antivenin at half-hour intervals because of the previous administration of horse serum. The second dose was followed by 10 cc. of antivenin given subcutaneously on the inner surface of the thigh. The leg was then bandaged and an ice cap applied, the reason for doing so being the hemorrhage and swelling of the forearms which followed the two small desensitizing doses. Within twenty-four hours all bleeding stopped, and he has made an uneventful recovery.

February 25, the day of transfusion, this case history was presented during a staff conference of the Gorgas Hospital. It was suggested that antivenin be used. It was stated that Dr. Herbert C. Clark, now director of the Gorgas Memorial Laboratory in Panama City, had successfully treated a case of purpura hemorrhagica with antivenin in October, 1928, at Quirigua, Guatemala.[1] His case, like the one here presented, was of so severe a nature that the man was nearly exsanguinated and not expected to live another twenty-four hours, horse serum and other treatment being of no avail.

The antivenin used in the case under discussion is marketed by the H. K. Mulford Company. It is a purified and concentrated serum globulin obtained from the blood of horses that have been highly immunized against the venom of certain tropical American serpents of the genus *Bothrops,* especially that of the fer-de-lance (*B. atrox*).

We will omit a discussion of the various conceptions anent the clotting of blood; however, it may be stated that it appears to be due to the coagulation of fibrinogen or prothrombin by a fibrin ferment in the presence of calcium salts. The disintegration of the leukocytes and the necessity of the platelets also influence it in some manner. There is, too, an antithrombin normally present which prevents under normal conditions activation of the prothrombin (theory of Howell).

It is possible that some toxic substance might be the causative factor of hemorrhage in this particular case. It does not seem plausible that the destruction of tissue in the field of operation could account for the production of a toxic serum protein which, entering the blood stream, would act directly or indirectly as a hemorrhage producing agent.

1. Taylor, K. P. A.: Apparent Cure of Purpura Hemorrhagica by Bothropic Antivenin, Bull. Antivenin Inst. America **3,** number 2.

Knowing that the naropharynx contains at all times a great variety of bacteria, it seems more reasonable to ascribe the formation of a possible toxic substance in this case to them.

Laboratory observations of the urine and blood were negative previous to the first operation.

Blood examination, January 4, revealed: hemoglobin, 70 per cent; red blood cells, 3,650,000; leukocytes, 6,700; coagulation time, seven minutes. From this time there was a steady fall in hemoglobin and red blood cells until February 24, when the count was: erythrocytes, 2,000,000; leukocytes, 20,000; hemoglobin, 40 per cent. The platelet count was 40,000. The bleeding time (ear) was twenty-four hours, coagulation time two and a half minutes; neutrophils were 84 per cent. No abnormal cells, other than those seen in a secondary anemia, were noted. February 26, the antivenin was administered. March 5, hemoglobin was 60 per cent; red blood cells, 3,550,000; leukocytes, 9,350. March 10, the platelets were 272,000; reticulated red corpuscles, 1.6 per cent. March 17, red blood cells, 4,290,000; hemoglobin, 65 per cent; white blood cells, 8,500; neutrophils, 78 per cent. At no time was blood found in the urine; a few hyaline casts and pus cells were occasionally found. The Wassermann reaction was negative. Tests for malaria were negative. The blood type was group I, Jansky.

CONCLUSIONS

Although we cannot account for the action of antivenin in this case, it appears that it might be a valuable agent in the treatment of hemorrhagic disease.

In giving the serum, it is necessary only to observe the same precautions as in giving any biologic remedy whose basis is horse serum.

MASTOIDITIS AND LATERAL SINUS THROMBOSIS IN AN INFANT

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AND
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That mastoiditis may occur at an early age without evidence of middle ear involvement has been recognized by numerous observers.[1] Of thirty-five cases of mastoiditis in children, Steinsleger [2] encountered nine in the range of ages from 7 weeks to 23 months Seven of these nine cases, or 77 per cent, showed no perforation of the tympanic membrane previous to operation. Grulee [3] states that sinus thrombosis in the new-born is due either to a general infection in the blood stream or to direct extension from the ear, and that it is practically impossible to differentiate it from meningitis when symptoms are present.

The following case is an example of the tender age at which these conditions may be found and of the insidious manner in which they may develop.

REPORT OF CASE

The parents had one other child, aged 6 years, in excellent health. There was no history of familial diseases. The patient, a girl, was born, Sept. 22, 1929. Her birth weight

1. Wagers, A. J.: Acute Mastoiditis, Apparently Primary, Occurring in Infant 7 months Old, Laryngoscope **34:** 453 (June) 1924. Heggie, N. M., and Kramer, W. J.: Mastoiditis Without Apparent Involvement of the Middle Ear, J. A. M. A. **82:** 1044 (March 29) 1924. Hempstead, B. E.: Mastoiditis Without Apparent Involvement of the Middle Ear, ibid. **81:** 1266 (Oct. 13) 1923. Broder, C. B.: Primary Mastoiditis, M. Rec. **88:** 482, 1915. Kerrison, P. D.: Mastoid Abscess Without Aural Discharge, Ann. Otol. Rhin. & Laryng. **28:** 949, 1919. Wilson, W.: Two Unusual Cases of Mastoiditis in Children, Brit. M. J. **2:** 398 (Aug. 29) 1924.

2. Steinsleger, M.: Mastoiditis in Infants, Rev. de Med., Rosario **9:** 29 (March) 1919; abstr. J. A. M. A. **72:** 1503 (May 17) 1919.

3. Grulee, C. G.: The New-Born, in Clinical Pediatrics, New York, D. Appleton & Co. **3:** 245, 1926.

was 6¼ pounds (2,835 Gm.). Delivery was normal. A slight upper respiratory infection occurred about one week prior to the last illness. This lasted a few days only and was recalled with difficulty by the mother. November 22, when the patient was about 8 weeks old, she had been restless and vomited. The family physician found a slight elevation in temperature. The following day the physician was again called because of restlessness. No cause for the infant's distress and fever could be found. The baby was brought to the hospital on the fourth day of the illness, at which time the rectal temperature was 104.6 F. The anterior fontanel was soft and not bulging; there was no rigidity of the neck. The nose and ears showed no evidence of inflammation. The chest, abdomen and extremities were normal. Knee jerks were elicited, and the pupils were equally contracted and did not react to bright light. The urine showed nothing abnormal. A blood examination showed: hemoglobin, 63 per cent; red blood cells, 3,250,000; white blood cells, 32,500, with 53 per cent polymorphonuclear cells, 17 per cent small lymphocytes and 9 per cent large lymphocytes. Metamyelocytes were 21 per cent. A roentgenogram of the chest showed signs of a pneumonitis.

During the preceding twenty-four hours the baby had been nursing fairly well. The temperature remained around 104 F. Both ear drums were of a normal glistening gray, with normal light reflex and normal landmarks. There were no areas of tenderness behind the ears. There was, however, a beginning tendency to incline the head toward the right shoulder, but no appreciable resistance was encountered on turning the head in various positions and anterior flexion of the head was well tolerated.

Lumbar puncture was done and 12 cc. of turbid fluid under increased pressure was withdrawn. Before the lumbar puncture needle was removed, 10 cc. of antimeningococcic serum was introduced into the spinal subarachnoid region. Examination of the spinal fluid revealed 9,200 cells, with from 90 to 95 per cent polymorphonuclear cells; a direct smear showed no organisms. We believed we were dealing with a meningitis and vigorous treatment, consisting of spinal drainage and introduction of serum, was instituted. The patient did not improve. The temperature became swinging in character and frequent attacks of cyanosis occurred. Marked restlessness required morphine. Generalized rigidity and a beginning protrusion of the right eyeball appeared together with a diminishing amount of fluid from the spinal subarachnoid region. A block at the base of the brain was considered probable and the right ventricle was tapped. Clear fluid was obtained with an occasional flake of fibrin. A report now on the culture of the spinal fluid read: "gram-positive staphylococcus; probably a contamination." Later specimens of spinal fluid were found to contain a similar staphylococcus. Because of the exophthalmos, which had become more pronounced, a cavernous sinus thrombosis was considered. The baby now was moribund. Convulsions had occurred. She died six days after admission to the hospital and ten days after the onset of the illness.

A bacteriologic study of the spinal fluid showed a gram-positive staphylococcus, which presented partial hemolysis of a brown type and produced a very pale-cream pigment.

A partial autopsy by Dr. H. W. Banks, pathologist at the Methodist Hospital, showed that the right eye was protruding and gave a spongy sensation on pressure. The right pupil was about 2 mm. in diameter and the left one about 3 mm. The nose and ears were normal.

The brain appeared to be blanched and edematous. The convolutions were soft, jelly-like, extremely broad and shallow. Pus poured out around the base of the brain, where there was also yellow, opaque, fibrinous and semifluid material particularly around the emergence of the cranial nerves. This occurred patchily and not uniformly over the base. The cerebellum was edematous, but no areas of hemorrhage or exudates were seen on its surface. A mass of delicate fibrin threads extended over the lateral surfaces of the brain stem and cord around the foramen magnum, producing a matted effect, which closed off the cranial zone from the cavity of the spinal column. The right lateral sinus was completely occluded and filled with a friable, ivory pink clot that was evidently old and was adherent to the walls of the sinus. As the incision in the sinus was continued around the ridge of the sphenoid to the sella turcica, there exuded a profuse creamy, yellow pus. Pressure on this region caused pus to exude from along the area of the optic tract as it entered the orbit, and pressure on the eye caused about 10 cc. of thick pus to exude from the tract, the eye receding to its normal position.

The right mastoid cells were filled with a creamy, straw-colored pus. The middle ear contained some thin, watery fluid. The drum was intact. Cultures taken from the right mastoid, the right lateral sinus and the brain showed a staphylococcus similar to the organism grown from the spinal fluid.

COMMENT

Mastoiditis in children is considered less dangerous than in adults and the urgency for surgical intervention less immediate. As explained by Jackson and Coates,[4] the bony cortex in a child is thin and the direction of the inflammation is usually external, causing carious erosion of the cortex and consequent escape of pus under pressure. Occasionally, as this case illustrates, the mastoid infection extends into the intracranial cavity, probably along the free communication between the lymphatic and blood vessels of the middle ear and mastoid and the interior of the skull, provided by the ununited petrosquamous suture.[5] Because of this relationship, children frequently develop an otitic meningitis or other intracranial complication without evidence that an aural lesion is present.

The most important element in this infant's course was the normal appearance of the right ear drum in the presence of a mastoiditis. There must have been pus under pressure in the mastoid on the third or fourth day of the illness, as the first specimen of spinal fluid obtained on the fifth day contained a large amount of pus, evidence that the sinus thrombosis had formed some time previously and that the infection had spread to the meninges. It is probable that the mastoid infection was present on the first day of the illness, the staphylococcus having been implanted there at the time of the respiratory infection one week previous to the onset of the last illness. Any departure from the normal appearance of the tympanic membrane would have been, in this patient, the only clue to the existing pathologic condition. It seems doubtful that a mastoid operation and ligation of the internal jugular vein on the day of admission would have changed the outcome. Nevertheless, that procedure would have been indicated had any clue to the mastoid infection been discovered.

226 Hume-Mansur Building.

4. Jackson, Chevalier; and Coates, G. M.: The Nose, Throat and Ear and Their Diseases, Philadelphia, W. B. Saunders Company, 1929, p. 535.
5. Smith S. M., in Sajous's Analytic Encyclopedia of Practical Medicine, Philadelphia, F. A. Davis Company **6**: 689, 1914.

The Structure of Neuroglia.—The study of gliomatous tumors has been considerably advanced in recent years by the development and perfection of neuroglial staining methods. The credit for this should be given to the Spanish school of neurohistologists, notably Cajal and del Rio-Hortega. The methods of using gold and silver solutions of the former and the technic of silver carbonate staining with all its variations of the latter have brought to light many details of importance in the furtherance of knowledge of the structure of neuroglia. To Cajal and his school is due much of the present knowledge of the histogenesis and structure of the astrocytic neuroglia, while del Rio-Hortega has demonstrated clearly the histogenesis, morphology and pathologic variations not only of the oligodendroglia but also of the other constituent of the third element, the microglia or mesoglia. These studies have clarified remarkably the knowledge of the normal structure of the neuroglia and mesoglia. In so doing they have made clearer the nature of gliomas.—Alpers, B. J.: Origin and Development of Giant Cells in Gliomas, *Arch. Neurol. & Psychiat.* **25**:281 (Feb.) 1931.

Clinical Notes, Suggestions and New Instruments

PRIMARY SARCOMA OF THE GALLBLADDER *

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Primary sarcoma of the gallbladder is rare. Kaufmann [1] states that there are only thirteen cases on record. Landsteiner,[2] in 1904, was the first to summarize the literature on the subject and to that date was able to collect only six alleged cases.

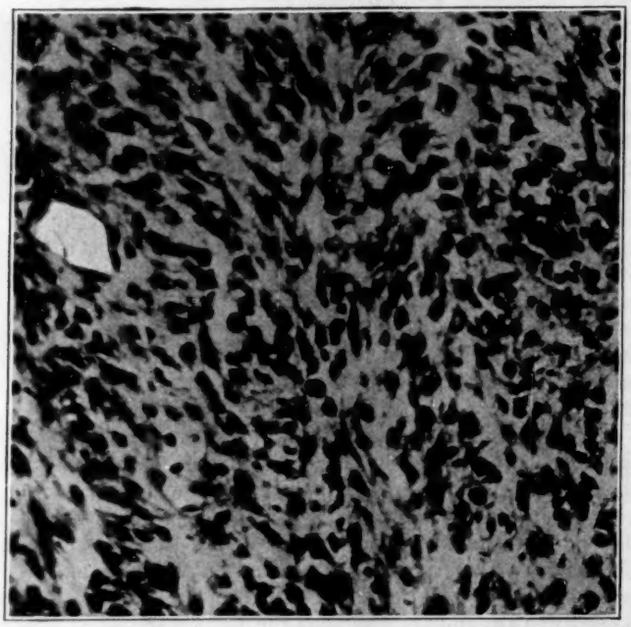

Fig. 1.—Section from primary sarcoma of the gallbladder showing rather densely packed moderate sized spindle cells; slightly reduced from a photomicrograph with a magnification of 320 diameters.

Three of these, he stated, could not be definitely considered primary sarcomas of the gallbladder and in the other three the diagnosis was not finally accepted by him because the original descriptions were not available. Landsteiner's own case was a myosarcoma. At a later date he described another gallbladder exhibiting a spindle cell sarcoma and a squamous cell carcinoma.[3] Bayer [4] reported a case of myxochondro-osteosarcoma with adenomatous hyperplasia of Luschka's ducts. Parlavecchio,[5] Hotes,[6] Bayer,[4] Griffon and Segal,[7] Iwasaki,[8] and Jaffé [9] have each recorded a case of spindle cell sarcoma of the gallbladder; in some of these, giant cells were a prominent feature. Carson and Smith [10] observed a case of round cell sarcoma. Wieting and Hamdi [11] reported a case of melanoblastoma, and Becker[12] described a case of "endothelioma" (sarcoma?) of the gallbladder.

REPORT OF CASE

B. C., a small white woman, aged 55, entered the University of Chicago Clinics May 23, 1930, complaining of a pain in the entire right side of the abdomen of two months' duration. This was described as a dull "gas pain" and was never very severe. The pain was relieved by lying flat on the back and aggravated on standing. There was no jaundice, nausea, vomiting or constipation. The patient had lost 15 pounds (7 Kg.) in the previous eight weeks and general weakness was rapidly increasing. Her appetite, usually good, had become very poor during this period. Past personal and family histories were irrelevant.

The salient feature on physical examination was a large smooth tumefaction in the right upper quadrant and upper portion of the right lower quadrant of the abdomen. By palpation this was found to be caused by a nodular, firm tumor mass that extended from three fingerbreadths below the costal margin to the level of the right anterior superior iliac spine; medially it extended to the midline and laterally into the right flank. The liver edge could be palpated above the tumor. The mass moved with respirations and could be moved slightly by manipulation. It was not tender. Bimanual examination revealed that this tumor was not connected with the uterus or adnexa. Routine laboratory examinations were negative.

After intravenous injection of tetiothalein sodium (N. N. R.) there was nonvisualization of the gallbladder. Barium fluoroscopy of the stomach and duodenum showed a displacement of these structures to the left by the tumor mass; a barium enema showed the hepatic flexure of the colon to be displaced downward. Films of the kidney, ureter and bladder showed normal kidney shadows and no stones.

Exploratory laparotomy was performed by Dr. L. R. Dragstedt, June 4. A right rectus incision was made and a small amount of colorless fluid escaped when the peritoneum was incised. A large hard tumor mass was found in the right upper quadrant primary in the right lateral wall of the gallbladder and extending into the right lobe of the liver. The gallbladder was enormously dilated, being about four times the normal size. About 50 cc. of colorless fluid was aspirated from the distended gallbladder. No stones were palpated in the bile passages. A small portion of the tumor mass was excised from the gallbladder wall for microscopic examination and the abdomen closed.

The patient was discharged from the hospital, June 24. Her general condition was fair; marked weakness persisted and it was thought the tumor mass had increased slightly in size.

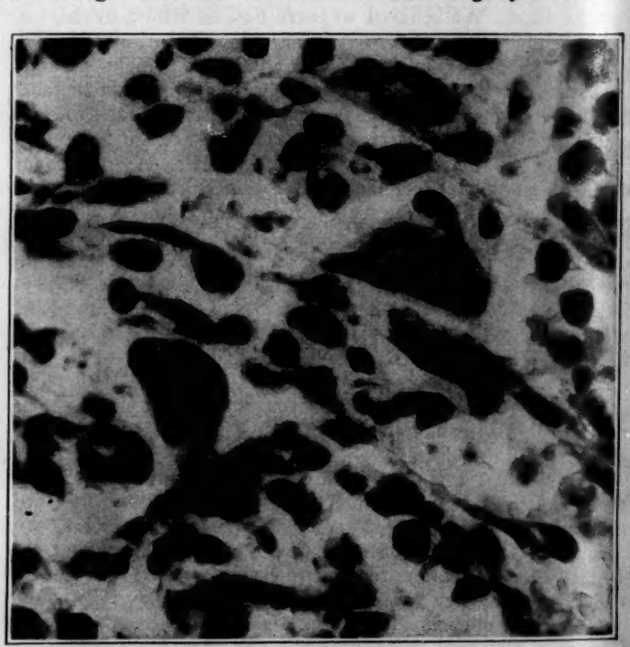

Fig. 2.—Section from primary sarcoma of the gallbladder showing area of round cells and two large tumor giant cells; slightly reduced from a photomicrograph with a magnification of 625 diameters.

Because of increased abdominal pain, further emaciation and weakness, the patient was readmitted to the hospital, July 10. The tumor mass had markedly increased in size, filling almost the entire abdomen and forming a smooth, firm, fixed protrusion. She was discharged again, July 29, temporarily relieved from pain, and several days later word was received that she had died. Necropsy was not obtained.

PATHOLOGIC STUDY

Sections of the fragment of tumor removed at operation showed areas of moderate sized spindle shaped cells with oval

* From the Department of Surgery, University of Chicago.

1. Kaufmann: Pathology for Students and Practitioners, translated by Reimann, Philadelphia, P. Blakiston's Son & Co. **2**: 1002, 1929.
2. Landsteiner: Wien. klin. Wchnschr., 1904, number 6, p. 163.
3. Landsteiner: Ztschr. f. klin. Med. **62**: 427, 1907.
4. Bayer: Beitr. z. path. Anat. u. z. allg. Path. **46**, 1909.
5. Parlavecchio: Arch. f. klin. Chir. **87**: 365, 1908.
6. Hotes: Inaug-Diss., Leipzig, 1910 (quoted by Iwasaki).
7. Griffon and Segal: Bull. Soc. anat. de Paris **72**: 586, 1897.
8. Iwasaki: Arch. f. klin. Chir. **104**: 84, 1914.
9. Jaffé: Zentralbl. f. Path. **29**: 571 (March) 1921.
10. Carson and Smith: Ann. Surg. **62**: 688, 1915.
11. Wieting and Hamdi: Beitr. z. path. Anat. u. z. allg. Path. **42**: 23, 1907.
12. Becker, Willhelm: Primary Endothelioma of the Gallbladder, J. A. M. A. **40**: 903 (April 4) 1903.

and rounded finely stippled nuclei. Between these cells were fine collagenic fibrils. Elsewhere there were dense strands of collagenic tissue separating small groups and strands of elongated spindle cells, many of which were here indistinguishable from normal fibroblasts. There were regions in which round cells were predominant; these had a small amount of cytoplasm and moderate sized round or oval nuclei. A number of large multinucleated tumor cells were also present (giant cells). Numerous mitotic figures were seen among the round and spindle shaped cells.

The diagnosis was spindle cell sarcoma (with areas of round cells) of the gallbladder.

COMMENT

The rarity of primary sarcoma of the gallbladder may be more apparent than real, for many large tumor masses arising in the gallbladder, and found on exploration to be inoperable, have no doubt gone without biopsy, the gross diagnosis of carcinoma being made. An analysis of the histories of the reported cases fails to disclose a clinical syndrome that may afford a basis for preoperative diagnosis of primary sarcoma of the gallbladder.

Of the thirteen cases referred to by Kaufmann, ten also exhibited cholelithiasis. In the case I have reported, as stated, cholelithiasis was not present, as far as could be determined at operation.

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SHOE-DYE POISONING: REPORT OF A CASE IN AN EIGHT MONTHS OLD INFANT *

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Shoe-dye poisoning is relatively uncommon in children. Riviere [1] reported eleven cases of cyanosis in children 1½ to 10 years of age following the dyeing of shoes with a dye containing aniline. Muehlberger [2] reported two cases in children of 3½ and 6 years of age. Ullmann [3] has called attention to the fact that children are especially susceptible to shoe-dye poisoning. Recently I reported a case of shoe-dye poisoning in a child of 2 years, at that time the youngest patient in the American literature.[4] The following case in an 8 months old infant is, I believe, the youngest reported case of this interesting condition.

D. C., a girl, aged 8 months, white, was admitted to the Children's Hospital, Sept. 3, 1928, because of fainting and turning blue. She had had a full term, normal delivery, with no cyanosis or convulsions. She had been breast fed for six months and was given a normal diet at the time of observation. She had always been perfectly well; she had had no similar attacks, convulsions or fainting spells.

Her parents were both well, with no history of epilepsy, allergy, tuberculosis or syphilis.

At 11:30 a. m., September 3, the child suddenly fell over backward in her highchair and five minutes later became unconscious. It was noted that she was then getting darker, and she was immediately brought to the Children's Hospital.

On entering the patient's room one was immediately struck by a strong sweetish chemical odor. The infant was lying quietly in bed, semicomatose but easily aroused. There was no odor of acetone on the breath. She was well developed and well nourished. The skin and lips had a peculiar cyanotic, somewhat grayish blue color. The tongue was clear; the mucous membranes were a dusky, bluish color. The tonsils and the pharynx were normal. There were no enlarged glands in the neck. The chest was of normal size and shape, with equal expansion on the two sides and a normal resonance throughout. The breath sounds were clear; there were no râles. The heart was not enlarged, and had a rate of 110; the heart sounds were normal; there were no murmurs. There were no masses and there was no rigidity or tenderness in the abdomen. The bones and joints were normal. An examination of the nervous system revealed no neck rigidity, Kernig's or Brudzinski's sign. The reflexes were normal. A laboratory report of the blood showed: hemoglobin, 60 per cent; red blood count, 4,250,000; white blood cells, 17,500; polymorphonuclears, 72 per cent. The temperature was 99.6 F. The urine was negative for albumin, sugar, acetone and urobilinogen.

The shoes of this infant, which had just been removed, exuded the same peculiar odor that was noticed on entering the room. The canvas uppers had apparently been painted with a black dye, being still moist. The mother subsequently said that because the white canvas uppers were soiled she had dyed them black that morning and after waiting one hour had put them on the baby. The symptoms appeared after the shoes were worn only one hour.

Venous blood was withdrawn for examination. It was dark brown and did not become redder when shaken up with air. Spectroscopic examination showed a faint but typical methemoglobin band. The infant was treated with fresh air and oxygen and was apparently normal in twenty-four hours.

The solvents used in shoe dyes, either aniline or nitrobenzene, have each been said to produce methemoglobinemia. In the cases reported in infants in which cyanosis followed the wearing of recently marked clothing, aniline [5] was isolated from the stamping ink in one series of cases and nitrobenzene in another.[6] Methemoglobin was reported in the blood of the infants of both series by spectroscopic examination.

Muehlberger [2] in 1925, analyzing the forty-eight cases of shoe-dye poisoning reported up to that time in the American and European literature, found that in the twenty-five American cases nitrobenzene was the chief toxic agent. He found that aniline was the chief toxic agent in the European cases reported.

In the ten cases which he reported at that time, Muehlberger found that six were due to aniline, these being the first to be reported in this country. Pateh [7] has since reported three more cases due to aniline.

It is now well known that absorption of aniline and nitrobenzene occurs through the skin with resultant symptoms like those found in shoe-dye poisoning. The chief manifestations are weakness, vertigo, somnolence, digestive disorders, headaches and cyanosis. The blood is dark, chocolate brown, almost black.

Both aniline and nitrobenzene are extremely toxic. For this reason a number of manufacturers of shoe dye have used other supposedly less toxic solvents. The solvent present in the dye used in this case was 20 per cent orthotoluidine. In the report [8] of a series of experiments which he conducted for the manufacturer of this shoe dye, Muehlberger found 30 per cent orthotoluidine to be much less toxic than aniline. Rabbits developed only slight cyanosis when the substance was applied to the shaved abdominal surface. He subsequently dyed the shoes of six young adults, who continued to wear the shoes for a period of from ten to fifteen hours after the application of the dye. In no case were there any noticeable symptoms of poisoning. Muehlberger concluded that for the average person a shoe dye containing 30 per cent orthotoluidine as a solvent is nontoxic.

COMMENT

Although 30 per cent orthotoluidine is apparently nontoxic for adults as a solvent for shoe dye, severe symptoms were produced within an hour in an infant, despite the use of a dye containing only 20 per cent of this substance. It may be reasonable to assume that the wearing of freshly dyed shoes remains a menace to infants.

CONCLUSIONS

1. A case of shoe-dye poisoning in an 8 months old infant was observed. This is believed to be the youngest patient in the literature.

2. Despite the use of orthotoluidine as a solvent in this shoe dye, a 20 per cent solution is apparently as toxic for infants as the aniline or nitrobenzene solvents formerly used.

Maccabee Building.

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* From the Children's Hospital.

1. Riviere, C.: Ann. de méd. et chir. inf. **15**: 551, 1911.
2. Muehlberger, C. W.: Shoe Dye Poisoning, J. A. M. A. **84**: 1987 (June 27) 1925.
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8. A copy of the original report by Dr. Muehlberger was sent to the author by the manufacturer of the shoe dye used in this case.

Special Article

THE COSTS OF MEDICAL EDUCATION

STUDENTS' EXPENDITURES *

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It was inevitable that during the centuries while medicine was becoming integrated from meaningless bits of folk-ways, mysterious superstitions and primitive incantations into an orderly array of logical demonstrable truths, little should be recorded as to the cost of obtaining the information necessary to qualify one as a physician. Moreover, there is consistency in the finding that search for and interpretation of facts bearing on vital processes have been uppermost in the minds of the great teachers and investigators.

There is reason to hope that those qualities which characterized our medical ancestors as indomitable searchers for truths may forever be perpetuated. But in a world of increasing social and economic complexities it is no longer possible to disregard cost. Honesty of purpose and integrity of action will always be high values in character, but there must be a limit to which any educational process should be carried for the individual who must later seek his livelihood from the training thus gained. To be sure, an individual trained in the thinking and investigating process should continue his education throughout life; but his actual college days are usually limited, to a degree, by the amount of time and money he feels he can invest and the readiness with which he can later adjust himself with his new equipment.

Were it possible to assemble data on the cost of medical education, from the time when Democedes founded the first medical school in Athens in 522 B. C. to the present, some interesting and doubtless valuable ratios might be found. Cost must of necessity increase with the expansion of medical education requirements. On the other hand, if students are to be expected to bear the increasing cost of medical education there is danger that the profession may become limited to the sons of the well-to-do.

Information for this study of the cost of medical education was drawn from every geographic subdivision of the United States, medical schools located in small cities and large metropolitan areas, state and non-state operated universities, long established and of more recent organization, and universities for both white and Negro students.

The expense data cover only the four years of required medical work. The cost of premedical training was omitted, since a measure of such expenditures would tend to be quite arbitrary. Preliminary college preparation is pursued in such a variety of schools and colleges and the range of work taken and time spent is so variable that it was thought best not to include any preliminary college work. Likewise, the cost of postgraduate and intern training has been omitted. Although the cost of postgraduate work may closely parallel

TABLE 1.—*Cost of Medical Education, 1929-1930: Tabulation (Enrolment by Year for*

	Name of Medical School	First Year					Second Year					
			Reports Returned					Reports Returned				
		Enrolment	Single	Married	Home	Total	Enrolment	Single	Married	Home	Total	
1	Alabama School of Medicine, Univ. of, University (Tuscaloosa)	52	11	..	..	11	51	5	1	..	6	1
2	Arkansas School of Medicine, University of, Little Rock	56	..	..	..	..	43	..	..	..	..	2
3	Baylor University College of Medicine, Dallas, Texas	123	15	..	1	16	88	30	..	..	30	3
4	Chicago, Rush Medical College, University of, Chicago	...	..	..	..	..	..	..	..	..	..	4
5	Colorado School of Medicine, University of, Denver	63	5	..	1	6	48	16	..	1	17	5
6	Columbia University College of Phys. and Surgs., New York	115	5	..	7	12	102	3	..	3	6	6
7	Dartmouth Medical School, Hanover, New Hampshire	23	5	..	..	5	16	..	..	..	..	7
8	Emory University School of Medicine, Atlanta, Georgia	57	17	..	..	17	45	2	..	..	2	8
9	Evangelists, College of Medical, Loma Linda–Los Angeles, Calif.	129	29	..	1	30	76	24	..	..	24	9
10	Georgia Medical Department, University of, Augusta	39	14	..	..	14	42	7	..	..	7	10
11	Harvard University Medical School, Boston	125	11	..	1	12	123	6	1	2	9	11
12	Howard University School of Medicine, Washington, D.C.	58	2	..	..	2	57	53	..	..	53	12
13	Illinois College of Medicine, University of, Chicago	173	2	..	..	2	128	..	..	..	..	13
14	Indiana University School of Medicine, Bloomington-Indianapolis	119	7	..	1	8	94	..	..	..	..	14
15	Jefferson Medical College of Philadelphia	155	16	..	1	17	148	25	..	1	26	15
16	Johns Hopkins University School of Medicine, Baltimore	69	..	..	..	..	72	1	..	..	1	16
17	Kansas School of Medicine, University of, Lawrence-Kansas City	71	..	..	..	..	59	..	..	..	..	17
18	Michigan Medical School, University of, Ann Arbor	160	59	1	1	61	143	53	1	..	54	18
19	Minnesota Medical School, University of, Minneapolis	172	..	..	..	..	143	..	..	..	..	19
20	Mississippi School of Medicine, University of, University	38	..	..	..	..	28	..	..	..	..	20
21	Missouri School of Medicine, University of, Columbia	40	1	..	1	2	34	2	..	..	2	21
22	Nebraska College of Medicine, University of, Omaha	100	9	3	..	12	84	7	..	..	7	22
23	North Carolina School of Medicine, University of, Chapel Hill	41	11	..	..	11	41	3	..	..	3	23
24	Northwestern University Medical School, Chicago	125	12	..	1	13	127	12	1	1	14	24
25	Ohio State University College of Medicine, Columbus	101	..	..	..	..	70	..	..	..	..	25
26	Oregon Medical School, University of, Portland	64	3	..	2	5	58	2	..	1	3	26
27	Pittsburgh School of Medicine, University of, Pennsylvania	67	20	..	6	26	67	15	..	..	15	27
28	Rochester School of Medicine, University of, New York	42	3	..	..	3	33	2	..	..	2	28
29	South Carolina, Medical College of the State of, Charleston	42	..	..	..	..	39	1	..	..	1	29
30	Stanford University School of Medicine, San Francisco	51	..	..	..	..	50	..	..	..	..	30
31	Texas School of Medicine, University of, Galveston	107	3	..	..	3	83	14	..	..	14	31
32	Tulane University of Louisiana School of Medicine, New Orleans	132	7	..	..	7	97	10	..	1	11	32
33	Utah School of Medicine, University of, Salt Lake City	31	7	1	1	9	30	9	..	..	9	33
34	Vermont College of Medicine, University of, Burlington	53	6	..	..	6	42	14	..	..	14	34
35	Virginia Dept. of Medicine, Univ. of, University (Charlottesville)	73	41	..	1	42	64	21	..	..	21	35
36	Washington University School of Medicine, St. Louis	82	4	..	..	4	71	2	..	..	2	36
37	West Virginia University School of Medicine, Morgantown	67	..	..	..	..	43	..	..	..	..	37
38	Wisconsin Medical School, University of, Madison	118	8	..	1	9	99	9	..	3	12	38
39	Woman's Medical College of Pennsylvania, Philadelphia	44	6	..	..	6	33	2	..	..	2	39
40	Yale University School of Medicine, New Haven	42	9	..	1	10	61	11	..	2	13	40
	Total	3,219	348	5	28	381	2,732	361	4	15	380	

* This discussion of the cost of medical education is limited to the amounts paid by the student toward a medical education and does not include the cost to either medical schools or hospitals in providing facilities for a medical education. All references to the cost of medical education in this article must be understood to carry this limitation.

undergraduate education in many respects, postgraduate study does not apply to all students and it may extend over widely varying lengths of time. The intern, in many instances, is in reality practicing medicine under direction, although not always licensed, and he usually receives compensation which largely or completely covers any expense.

Early in 1929, forty medical schools located in the several geographic subdivisions of the United States approved of the plan to study one phase of the cost of medical education by means of students' expense books and offered to place these books in the hands of all medical students who would volunteer to keep the record. They also offered to supervise the recording of data and to maintain, as well as possible, through a member of the faculty, an interest in the project.

In nearly every instance the dean of the medical school voiced his doubt that all medical students would cooperate and, therefore, books were furnished only to approximately 70 per cent of the school enrolment. Altogether, 7,200 expense books were sent to forty medical schools, having an enrolment for 1929 of 10,947 students. In a few instances, additional books were sent on request of the dean. There was no direct contact between the American Medical Association headquarters and the students; the presentation of the subject and all subsequent follow-up contact to insure the largest number of returns and the greatest possible accuracy were through the dean or a member of the faculty of the student's own school. It is impossible, therefore, to make any statement or explanation concerning the number of returns credited to each school.

The percentage of books itemized throughout the year and returned from some schools was satisfactory; in other instances the returns were disappointing. Six schools failed to return any expense books. The total number of expense books which were found complete and which showed a degree of accuracy necessary for inclusion in the study was 1,253. This number, although representing a precariously small percentage for a detailed statistical study, is nevertheless sufficient from which to derive some significant hints as to the trend of the costs of medical education.

With a relatively small number of returns it becomes more and more difficult to arrive at as accurate deductions as could be made had the percentage approached more nearly 100. However, an attempt has been made to point out a few items of interest, as follows:

1. The variation, if any, in the cost of medical education to students, as to the class year, in the several geographic subdivisions of the United States.

2. The apparent cost of each of the several major expense items which contribute to the cost of the medical education.

3. The variation in the cost of each of the several major expense items according to class periods.

4. The distribution, by expense intervals, according to class periods and geographic subdivisions.

5. The distribution of the major expense items and magnitude groups according to the fractional percentage of the total cost.

These items do not represent the limit of inquiries for which an answer might be sought in the assembled data; but for general information, the five that have been outlined seem adequate. In all statistical procedures the probable error becomes larger the smaller the percentage of possible returns available, and therefore any conclusions drawn from the present study must be made very guardedly. Nevertheless, an effort has been made to present faithfully the expense data actually recorded

of Reports by Medical Schools According to Year of College Each School is Given)

	Third Year					Fourth Year					Year Not Stated			Total					
	Enrolment	Reports Returned				Enrolment	Reports Returned				Reports Returned			Enrolment	Reports Returned				
		Single	Married	Home	Total		Single	Married	Home	Total	Single	Home	Total		Single	Married	Home	Total	
1	..	..	..	..	..	..	..	..	..	..	..	..	..	103	16	1	..	17	1
2	33	1	..	..	1	30	..	..	..	..	..	..	..	162	1	..	..	1	2
3	73	9	..	3	12	87	14	..	..	14	..	..	..	371	68	..	4	72	3
4	141	22	..	2	24	203	4	..	..	4	1	..	1	344	27	..	2	29	4
5	51	8	..	1	9	43	4	..	..	4	..	..	..	205	33	..	3	36	5
6	102	3	..	..	3	104	..	..	..	..	..	..	..	423	11	..	10	21	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	39	5	..	..	5	7
8	48	7	..	..	7	46	1	1	..	2	10	..	10	196	37	1	..	38	8
9	87	22	..	..	22	78	2	..	..	2	..	..	..	370	77	..	1	78	9
10	29	2	..	1	3	30	2	..	..	2	3	..	3	140	28	..	1	29	10
11	131	9	..	3	12	137	4	..	..	4	2	..	2	516	32	1	6	39	11
12	38	34	..	1	35	68	4	..	..	4	1	..	1	241	94	..	1	95	12
13	128	..	..	..	..	120	..	..	..	..	..	..	..	549	2	..	..	2	13
14	106	..	..	..	..	105	..	..	..	..	..	..	..	424	7	..	1	8	14
15	143	22	..	2	24	140	11	..	2	13	4	..	4	586	78	..	6	84	15
16	72	1	..	..	1	70	..	..	..	..	..	..	..	283	2	..	..	2	16
17	54	..	..	..	..	49	..	..	..	..	..	..	..	233	....	..	..	....	17
18	170	30	..	..	30	166	3	..	..	3	5	..	5	639	150	2	1	153	18
19	113	..	..	..	..	100	..	..	..	..	..	..	..	528	....	..	..	....	19
20	....	..	..	..	..	..	..	..	..	..	..	..	..	66	....	..	..	....	20
21	....	..	..	..	..	..	..	..	..	..	..	..	..	74	3	..	1	4	21
22	67	8	..	1	9	65	2	1	1	4	..	..	..	316	26	4	2	32	22
23	....	..	..	..	..	..	..	..	..	..	..	..	..	82	14	..	..	14	23
24	133	9	3	1	13	137	3	1	..	4	3	..	3	522	39	5	3	47	24
25	79	..	..	..	..	61	..	..	..	..	..	..	..	311	....	..	..	....	25
26	60	9	1	..	10	45	..	1	..	1	1	1	2	227	15	2	4	21	26
27	66	..	..	..	..	60	2	..	..	2	2	1	3	260	39	..	7	46	27
28	24	2	..	..	2	24	2	..	..	2	..	..	..	133	9	..	..	9	28
29	41	1	..	..	1	37	1	..	..	1	..	..	..	159	3	..	..	3	29
30	43	..	..	..	..	49	..	..	..	..	..	..	..	193	....	..	..	....	30
31	75	5	..	..	5	43	34	2	2	38	..	..	..	308	56	2	2	60	31
32	103	7	..	..	7	100	18	..	6	24	5	..	5	432	47	..	7	54	32
33	..	..	..	..	..	..	..	..	..	..	1	..	1	61	17	1	1	19	33
34	31	2	..	..	2	30	..	..	..	..	..	..	..	156	22	..	..	22	34
35	49	22	..	..	22	59	23	..	..	23	..	..	..	245	107	..	1	108	35
36	78	1	..	..	1	77	..	..	..	..	1	..	1	308	8	..	..	8	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	110	....	..	..	....	37
38	48	8	..	1	9	39	5	..	..	5	7	..	7	304	37	..	5	42	38
39	24	2	..	..	2	15	..	..	..	..	..	..	..	116	10	..	..	10	39
40	54	12	..	..	12	55	5	..	1	6	4	..	4	212	41	..	4	45	40
	2,524	258	4	16	278	2,472	144	6	12	162	50	2	52	10,947	1,161	19	73	1,253	

and reported by 1,161 medical students for the college year 1929 and 1930. Neither the medical profession, the statistician, nor the public should be too exacting or critical of the apparent conclusions.

Examination of these reports indicates that, of the 1,253 students who returned itemized expense books, 19 were married and 73 were living at home. Obviously, the demands on the married students differ sufficiently from those made on the single students to cause these reports to be excluded from the tabulations. Because of the reduction in board, room, laundry and a number of other miscellaneous items, it would be not only unfair but also statistically dishonest to include in the study the expenses of those living at home. Therefore, the figures shown in tables 2, 3, 4, 5, 6 and 7 are for unmarried students living away from home. This number totals 1,161 (table 1).

TABLE 2.—*Cost of Medical Education, 1929-1930*

No.	Name of Medical School	1st Year Enrolment	1st Year Returned	2d Year Enrolment	2d Year Returned	3d Year Enrolment	3d Year Returned	4th Year Enrolment	4th Year Returned	Year Not Stated Enrolment	Year Not Stated Returned	Total Enrolment	Total Returned	Total Per Cent Returned	No.
1	Alabama School of Med., Univ. of, University (Tuscaloosa)	52	11	51	5	...	..	...	..	..	..	103	16	15.5	1
2	Arkansas School of Medicine, University of, Little Rock	56	..	43	..	33	1	30	..	..	..	162	1	0.6	2
3	Baylor University College of Medicine, Dallas, Texas	123	15	88	30	73	9	87	14	..	..	371	68	18.4	3
4	Chicago, Rush Medical College, University of, Chicago	...	..	...	..	141	22	203	4	..	1	344	27	7.8	4
5	Colorado School of Medicine, University of, Denver	63	5	48	16	51	8	43	4	..	..	205	33	16.1	5
6	Columbia University College of Phys. and Surgs., New York	115	5	102	3	102	3	104	..	..	..	423	11	2.6	6
7	Dartmouth Medical School, Hanover, New Hampshire	23	5	16	..	...	..	...	..	..	..	39	5	12.8	7
8	Emory University School of Medicine, Atlanta, Georgia	57	17	45	2	48	7	46	1	..	10	196	37	18.9	8
9	Evangelists, College of Medical, Loma Linda-Los Angeles	129	29	76	24	87	22	78	2	..	..	370	77	20.8	9
10	Georgia Medical Department, University of, Augusta	39	14	42	7	29	2	30	2	..	3	140	28	20.0	10
11	Harvard University Medical School, Boston	125	11	123	6	131	9	137	4	..	2	516	32	6.2	11
12	Howard University School of Medicine, Washington, D.C.	58	2	57	53	58	34	68	4	..	1	241	94	39.0	12
13	Illinois College of Medicine, University of, Chicago	173	2	128	..	128	..	120	..	..	..	549	2	0.4	13
14	Indiana University Sch. of Med., Bloomington-Indianapolis	119	7	94	..	106	..	105	..	..	..	424	7	1.7	14
15	Jefferson Medical College of Philadelphia	155	16	148	25	143	22	140	11	..	4	586	78	13.3	15
16	Johns Hopkins University School of Medicine, Baltimore	69	..	72	1	72	1	70	..	..	..	283	2	0.7	16
17	Kansas School of Medicine, Univ. of, Lawrence-Kansas City	71	..	59	..	54	..	49	..	..	..	233	..	0.0	17
18	Michigan Medical School, University of, Ann Arbor	160	59	143	53	170	30	166	3	..	5	639	150	23.5	18
19	Minnesota Medical School, University of, Minneapolis	172	..	143	..	113	..	100	..	..	..	528	..	0.0	19
20	Mississippi School of Medicine, University of, University	38	..	28	..	...	..	...	..	..	..	66	..	0.0	20
21	Missouri School of Medicine, University of, Columbia	40	1	34	2	...	..	...	..	..	..	74	3	4.1	21
22	Nebraska College of Medicine, University of, Omaha	100	9	84	7	67	8	65	2	..	..	316	26	8.2	22
23	North Carolina School of Medicine, Univ. of, Chapel Hill	41	11	41	3	...	..	...	..	..	..	82	14	17.1	23
24	Northwestern University Medical School, Chicago	125	12	127	12	133	9	137	3	..	3	522	39	7.5	24
25	Ohio State University College of Medicine, Columbus	101	..	70	..	79	..	61	..	..	..	311	..	0.0	25
26	Oregon Medical School, University of, Portland	64	3	58	2	60	9	45	..	..	1	227	15	6.6	26
27	Pittsburgh School of Medicine, University of, Pennsylvania	67	20	67	15	66	..	60	2	..	2	260	39	15.0	27
28	Rochester School of Medicine, University of, Rochester, N.Y.	42	3	33	2	34	2	24	2	..	..	133	9	6.8	28
29	South Carolina, Medical College of the State of, Charleston	42	..	39	1	41	1	37	1	..	..	159	3	1.9	29
30	Stanford University School of Medicine, San Francisco	51	..	50	..	43	..	49	..	..	..	193	..	0.0	30
31	Texas School of Medicine, University of, Galveston	107	3	83	14	75	5	43	34	..	..	308	56	18.2	31
32	Tulane University of Louisiana School of Med., New Orleans	132	7	97	10	103	7	100	18	..	5	432	47	10.9	32
33	Utah School of Medicine, University of, Salt Lake City	31	7	30	9	...	..	...	..	..	1	61	17	27.9	33
34	Vermont College of Medicine, University of, Burlington	53	6	42	14	31	2	30	..	..	..	156	22	14.1	34
35	Virginia Dept. of Med., Univ. of, University (Charlottesville)	73	41	64	21	49	22	59	23	..	..	245	107	43.7	35
36	Washington University School of Medicine, St. Louis	82	4	71	2	78	1	77	..	..	1	308	8	2.6	36
37	West Virginia University School of Medicine, Morgantown	67	..	43	..	...	..	...	..	..	..	110	..	0.0	37
38	Wisconsin Medical School, University of, Madison	118	8	99	9	48	8	39	5	..	7	304	37	12.2	38
39	Woman's Medical College of Pennsylvania, Philadelphia	44	6	33	2	24	2	15	..	..	..	116	10	8.6	39
40	Yale University School of Medicine, New Haven, Conn.	42	9	61	11	54	12	55	5	..	4	212	41	19.3	40
	Total	3,219	348	2,732	361	2,524	258	2,472	144	..	50	10,947	1,161	10.6	

The number of returns for this group (unmarried and not living at home), based on each college enrolment, varied from 0.4 per cent to 43.7 per cent. The number of returns and the enrolment, according to the college year and the total for each school, is found in table 2.

The number of reports from several schools was so small that the average, either for the total amount expended for the year or for the expense for each class year, cannot be accepted as statistically dependable; it should be used simply as an interesting trend. In the case of seven schools, however, each of which returned more than fifty reports, the results call for more than passing notice. The total average expense to students recorded from these schools varies from $902.16 for Howard University School of Medicine, Washington, D. C., to $1,342.64 for Jefferson Medical College, Philadelphia. Based on the percentage of enrolment, however, the returns of other schools should be considered in this connection; namely, Alabama School of Medicine, Colorado School of Medicine, Emory University School of Medicine, the University of Georgia Medical Department, North Carolina School of Medicine, Pittsburgh School of Medicine, Utah School of Medicine, and Yale University School of Medicine. Although the total number of reports returned from these schools was smaller than for some, they represent a higher percentage of the school's enrolment and therefore may be accepted more readily as indicative of actual cost in these institutions. The average expense of these eight schools varies from $811.63 for the University of Georgia Medical Department to $1,446.63 for Yale University School of Medicine. It would appear, therefore, that the low average annual student expense for a single medical school is found among the South Atlantic states, although the Pacific and Mountain states are in the lowest range and the high average lies between the New England and Middle Atlantic states. An average taken by class periods seems to indicate that the amount expended by sophomores is lowest, $1,114.58, whereas seniors seem to have the heaviest expenses, $1,242.76. This difference is not as great as might be expected.

Except in one or two instances, the number of returns according to class periods is altogether too small to make any safe or accurate comparison between schools or geographic subdivisions. The averages therefore shown in table 3 must be accepted as indica-

tive of the experiences of only as many as are represented by the returns received.

The annual cost of each of the several major expense items that contribute to the cost of medical education shows in some instances a fairly wide variation (table 4).

That portion of the student's expense paid for tuition and fees is beyond his control, once the selection of a medical school has been made. There is, however, a wide choice of schools as far as tuition and fees are concerned. A number of factors seem to operate in the great diversity of this expense item. There are several schools that offer only the first two years of medical training. The tuition and fees in these schools varies from $50 to $410 a year. Among the schools conducting a full medical course, the annual charge for tuition and fees extends from $66 to $610. Twenty-seven universities, mostly state institutions, charge an additional fee for students who are nonresident in the state. These nonresident charges vary from $10 a term to $300 a year. Thirteen of the universities in the present study have additional charges for nonresidents.

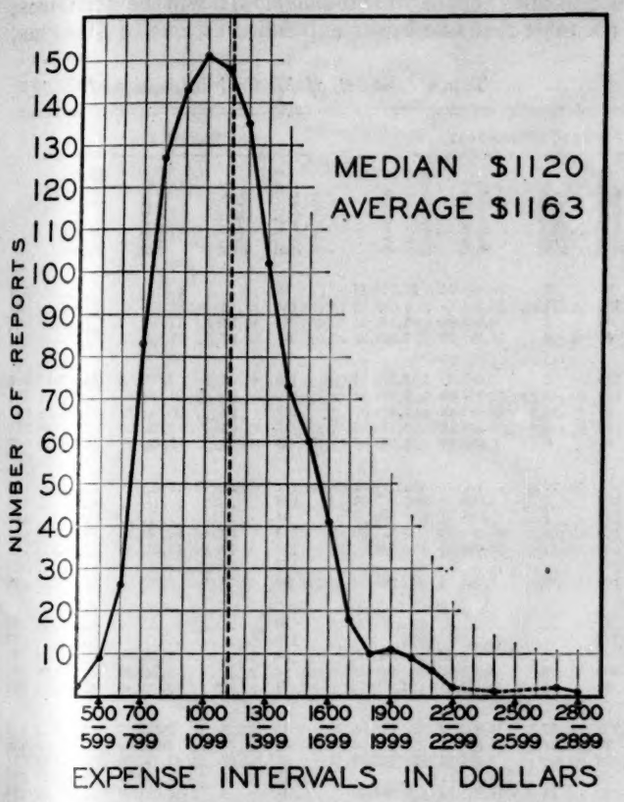

Chart 1.—Graphic representation of 1,161 expense reports according to the number in each magnitude group or expense interval.

Among the reports returned in this study, 172 were found to be from nonresident students of the following ten medical schools (the number of nonresident students is given after each school):

University of Arkansas School of Medicine, 1.
University of Colorado School of Medicine, 8.
University of Indiana School of Medicine, 1.
University of Michigan Medical School, 66.
University of Missouri School of Medicine, 2.
University of Nebraska School of Medicine, 12.
University of Oregon Medical School, 2.
University of Vermont College of Medicine, 14.
University of Virginia Department of Medicine, 64.
University of Wisconsin Medical School, 2.

The average annual cost of tuition and fees in the medical schools enumerated will not bear a parallel comparison with the remaining averages shown in table 4 under tuition and fees since the averages in these ten schools is increased by the extra charges paid by the nonresident students.

Making necessary corrections for the nonresident students' fees, it is found that the lowest fees of the medical schools included in this study are those paid by students in the University of Texas School of Medicine and the highest amounts are paid at Johns Hopkins University School of Medicine.

The average of the amount expended for medical books, instruments, medical journals, and the like, has a range which lies between $66.57 found as an average for fourteen students at the University of North Carolina School of Medicine, and $188.83 the average for sixteen students at the University of Alabama School of Medicine. Sixteen of the thirty-four schools reporting showed an average expenditure for this item of more than $100, while eighteen showed an expenditure of less than $100.

Board and room was considered jointly, since the arrangement in many places is to pay for board and room in a single sum. Many of the students, therefore, did not separate the amounts paid for each item, and it was possible to consider them only as a joint expense. The expenditure for this item shows a low average of $271.75 from the University of Illinois College of Medicine and a high average of $569.45 representing thirty-two reports from the Harvard University Medical School. Again the low average for Illinois is

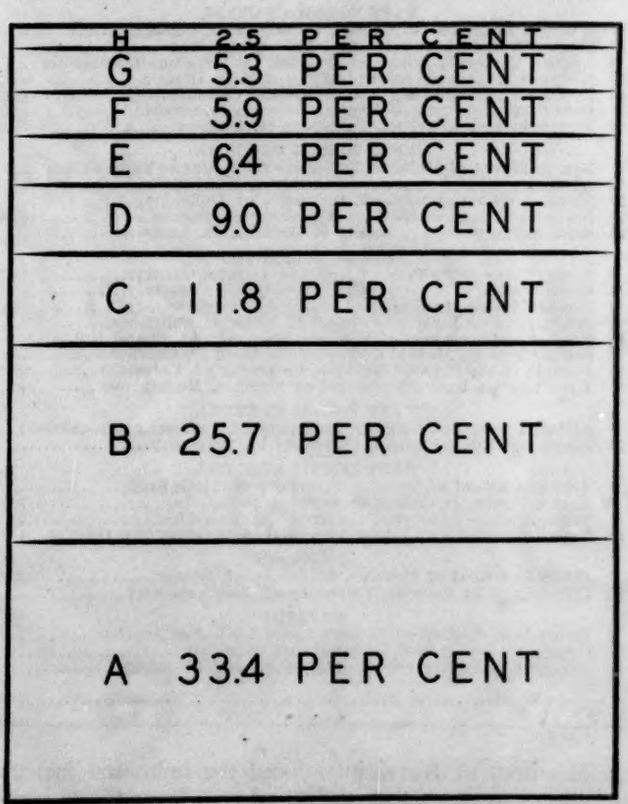

Chart 2.—Average annual total cost distributed according to percentage paid for each major expense group. Major expense groups: *A*, board and room, 1,161 reports, average $388.54; *B*, tuition and fees, 1,161 reports, average $298.60; *C*, clothing and laundry, 1,159 reports, average $137.30; *D*, medical books, journals, instruments, etc., 1,159 reports, average $105.68; *E*, recreation, 1,119 reports, average $76.63; *F*, travel, 1,119 reports, average $70.99; *G*, miscellaneous, 1,148 reports, average $62.22; *H*, insurance and interest, 443 reports, average $77.45.

not dependable, since only two reports were received. Clothing and laundry were combined for the same reason, and this item shows a variation of from $61.68 for the University of Missouri School of Medicine to $178.61 found as the average of forty-seven reports from Tulane University of Louisiana School of Medicine. The $61.68 represents an expenditure of only three students, which cannot be accepted as altogether representative. One other lower average of $50.46 was reported by one student of the University of Arkansas School of Medicine.

person lending the money are legitimate inclusions, since the principal sum makes possible the pursuit of the educational courses. Presumably the 718 students who did not report expenditures for insurance and interest either earned the money or received it as a gift. The expenditure for this item varied from $29.83, the average reported by three students from the University of Missouri School of Medicine, to $114.58, the average of seventeen reports from the Tulane University of Louisiana School of Medicine. It will be seen from the table that two lower expenditures, one of $9.44 and

TABLE 3.—*Cost of Medical Education, 1929-1930,*

	Medical Schools Arranged According to Geographic Subdivisions of the United States	First Year				Second Year				
		Number Registered	Reports Returned	Amount Reported	Average	Number Registered	Reports Returned	Amount Reported	Average	
	NEW ENGLAND									
7	Dartmouth Medical School, Hanover, N.H.	23	5	$8,583.76	$1,716.75	16	..	.....	.....	7
11	Harvard University Medical School, Boston	125	11	18,584.75	1,689.52	123	6	$9,415.54	$1,569.26	11
34	Vermont College of Medicine, University of, Burlington	53	6	6,889.63	1,148.27	42	14	17,398.04	1,242.72	34
40	Yale University School of Medicine, New Haven, Conn.	42	9	14,107.63	1,567.51	61	11	17,440.08	1,585.46	40
	MIDDLE ATLANTIC									
6	Columbia University College of Physicians and Surgeons, New York	115	5	7,082.69	1,416.54	102	3	4,323.33	1,441.11	6
15	Jefferson Medical College of Philadelphia	155	16	22,157.40	1,384.84	148	25	31,592.80	1,279.71	15
27	Pittsburgh School of Medicine, University of, Pennsylvania	67	20	28,481.48	1,424.07	67	15	20,516.73	1,367.78	27
28	Rochester School of Medicine, University of, Rochester, N.Y.	42	3	3,828.13	1,276.04	33	2	2,634.83	1,317.42	28
39	Woman's Medical College of Pennsylvania, Philadelphia	44	6	6,858.93	1,143.16	33	2	2,006.59	1,003.30	39
	EAST NORTH CENTRAL									
4	Chicago, Rush Medical College, University of, Chicago	...	..	.....	.....	...	..	.....	.....	4
13	Illinois College of Medicine, University of, Chicago	173	2	1,606.77	803.39	128	..	.....	.....	13
14	Indiana University School of Medicine, Bloomington-Indianapolis	119	7	5,948.52	849.79	94	..	.....	.....	14
18	Michigan Medical School, University of, Ann Arbor	160	59	69,690.79	1,181.20	143	53	62,242.13	1,174.38	18
24	Northwestern University Medical School, Chicago	125	12	16,098.64	1,341.55	127	12	16,964.64	1,413.72	24
25	Ohio State University College of Medicine, Columbus	101	..	.....	.....	70	..	.....	.....	25
38	Wisconsin Medical School, University of, Madison	118	8	7,483.12	935.39	99	9	8,892.03	988.00	38
	WEST NORTH CENTRAL									
17	Kansas School of Medicine, University of, Lawrence-Kansas City	71	..	.....	.....	59	..	.....	.....	17
19	Minnesota Medical School, University of, Minneapolis	172	..	.....	.....	143	..	.....	.....	19
21	Missouri School of Medicine, University of, Columbia	40	1	805.62	805.62	34	2	1,767.86	883.93	21
22	Nebraska College of Medicine, University of, Omaha	100	9	8,543.53	949.28	84	7	6,740.27	962.90	22
36	Washington University School of Medicine, St. Louis	82	4	4,531.01	1,132.75	71	2	2,385.46	1,192.73	36
	SOUTH ATLANTIC									
8	Emory University School of Medicine, Atlanta, Ga.	57	17	16,295.86	958.58	45	2	2,159.83	1,079.92	8
10	Georgia Medical Department, University of, Augusta	39	14	11,023.01	787.36	42	7	5,944.89	849.27	10
12	Howard University School of Medicine, Washington, D.C.	58	2	1,507.23	753.62	57	53	47,237.80	891.28	12
16	Johns Hopkins University School of Medicine, Baltimore	69	..	.....	.....	72	1	1,400.37	1,400.37	16
23	North Carolina School of Medicine, University of, Chapel Hill	41	11	10,575.24	961.39	41	3	3,084.20	1,028.07	23
29	South Carolina, Medical College of the State of, Charleston	42	..	.....	.....	39	1	883.25	883.25	29
35	Virginia Department of Medicine, University of, University	73	41	53,865.36	1,313.79	64	21	22,392.40	1,066.30	35
37	West Virginia University School of Medicine, Morgantown	67	..	.....	.....	43	..	.....	.....	37
	EAST SOUTH CENTRAL									
1	Alabama School of Medicine, University of, University (Tuscaloosa)	52	11	12,273.47	1,115.77	51	5	5,609.20	1,121.84	1
20	Mississippi Medical School, University of, University	38	..	.....	.....	28	..	.....	.....	20
	WEST SOUTH CENTRAL									
2	Arkansas School of Medicine, University of, Little Rock	56	..	.....	.....	43	..	.....	.....	2
3	Baylor University College of Medicine, Dallas, Tex.	123	15	16,231.16	1,082.08	88	30	34,337.41	1,144.58	3
31	Texas School of Medicine, University of, Galveston	107	3	2,614.46	871.49	83	14	12,339.28	881.38	31
32	Tulane University of Louisiana School of Medicine, New Orleans	132	7	8,148.71	1,164.10	97	10	10,554.46	1,055.45	32
	MOUNTAIN									
5	Colorado School of Medicine, University of, Denver	63	5	4,907.20	981.44	48	16	16,629.90	1,039.37	5
33	Utah School of Medicine, University of, Salt Lake City	31	7	5,709.84	815.69	30	9	7,983.19	887.02	33
	PACIFIC									
9	Evangelists, College of Medical, Loma Linda-Los Angeles	129	29	28,131.46	970.05	76	24	24,598.03	1,024.92	9
26	Oregon Medical School, University of, Portland	64	3	2,323.96	774.65	58	2	2,487.04	1,243.52	26
30	Stanford University School of Medicine, San Francisco	51	..	.....	.....	50	..	.....	.....	30
	Total	3,219	348	$404,889.36	$1,163.47	2,732	361	$402,361.58	$1,114.58	

The item of travel introduced the unknown factors of the distance of the student's home from the university and the number of trips made to and from the university during the year. These variables should be borne in mind in considering the figures, which show that the amounts spent vary from an average of $24.70 for three students at the University of Missouri School of Medicine to $140.14 reported as an average for five students from Dartmouth Medical School.

It should be noted that, of the 1,161 students, only 443 have made reports on insurance and interest. This item is justifiably included on the ground that the interest on borrowed money to finance an education and the premiums on life insurance carried to protect the

one of $13.50, were reported by one student in each of two schools and a high expenditure of $174 was reported by one student in another school. These, however, are individual experiences and cannot be used as representative.

The average amount paid by students for recreation was found to vary from the low figure of $20.86, reported by ten students from Womans' Medical College of Pennsylvania, to the high amount of $153.53, shown by five reports from Dartmouth Medical School. Miscellaneous expenses varied from $26.36, shown as the average of ninety-two students at Howard University School of Medicine, to $111.61, reported as an average of five students at Dartmouth Medical School.

Two reports from the University of Illinois College of Medicine show a low average of $23.43, and two reports from Johns Hopkins University School of Medicine indicate a high average of $130.37; but these are too close to individual experiences to be accepted as representative.

It will be noted that the average total cost to students reaches the high amount of $1,716.75, shown by five reports from Dartmouth Medical School, with Harvard University Medical School a close second, showing an average of $1,621.75, based on thirty-two reports. The low average total of $693.81 cannot be used, since this represents but one report and furthermore since the lowest total expense reported was $424.99 from the University of Wisconsin Medical School.

Although the work of not only lectures and laboratory but also demonstration and clinic has become increasingly more exacting for the student, it is evident that about half of them find time through either choice or necessity for some kind of gainful work. The earnings of 518 students shows an average of $283.48 for 1929-1930. The low average was reported by eight students from Emory University School of Medicine, $29.81. Seven students from the University of Oregon Medical School reported an average of $427.12. The average of $437.12 reported from Dartmouth Medical School was by two students only. The detailed figures for all these major items according to school and year are given in table 4.

An examination of the average annual expense for each major item according to class periods shows that tuition and fees seem to be lowest for seniors and highest for freshmen. It appears that sophomores pay least and freshmen most for medical books, journals and instruments. There is but a slight variation in the cost of board and room; however, sophomores seem to spend least and seniors most for this item. The freshman gets by with the least expense for clothing and laundry, while this item draws heaviest on seniors. The increase here seems to be a gradual, fairly even step up during the four class periods. Possibly a gradual growth in social prestige may have an influence. The sophomores seem to travel slightly less, or at least their average expense is slightly under all other classes. The highest average travel expense seems to fall on seniors. The amount paid for interest and insurance is lowest for freshmen and highest for seniors. Theoretically, at least, this is as this item might be expected to stand. Juniors spend least and seniors most for recreation. The miscellaneous items are surprisingly closely divided;

by Colleges, According to Class Periods

	Third Year				Fourth Year				Unidentified			Total				
	Number Registered	Reports Returned	Amount Reported	Average	Number Registered	Reports Returned	Amount Reported	Average	Reports Returned	Amount Reported	Average	Number Registered	Reports Returned	Amount Reported	Average	
7	...	..	.....	.....	...	..	.....	.....	..	.....	.....	39	5	$ 8,583.76	$1,716.75	7
11	131	9	$15,098.15	$1,677.57	137	4	$6,146.59	$1,536.65	2	$2,651.11	$1,325.56	516	32	51,896.14	1,621.75	11
34	31	2	2,179.34	1,089.67	30	..	.....	.....	..	.....	.....	156	22	26,467.01	1,203.05	34
40	54	12	14,705.97	1,225.50	55	5	6,233.83	1,246.77	4	6,824.41	1,706.10	212	41	59,311.92	1,446.63	40
6	102	3	4,404.59	1,468.20	104	..	.....	.....	..	.....	.....	423	11	15,810.61	1,437.33	6
15	143	22	29,400.36	1,336.38	140	11	15,384.89	1,398.63	4	5,790.37	1,447.59	586	78	104,725.82	1,342.64	15
27	66	..	.....	.....	60	2	2,690.77	1,345.38	2	3,630.84	1,815.42	260	39	55,319.82	1,418.46	27
28	34	2	2,504.29	1,252.15	24	2	2,524.77	1,262.38	..	.....	.....	133	9	11,492.02	1,276.89	28
39	24	2	2,402.85	1,201.43	15	..	.....	.....	..	.....	.....	116	10	11,268.37	1,126.84	39
4	141	22	27,290.39	1,240.47	203	4	6,729.02	1,682.25	1	1,668.63	1,668.63	344	27	35,688.04	1,321.78	4
13	128	..	.....	.....	120	..	.....	.....	..	.....	.....	549	2	1,606.77	803.39	13
14	106	..	.....	.....	105	..	.....	.....	..	.....	.....	424	7	5,948.52	849.79	14
18	170	30	35,206.17	1,173.54	166	3	3,219.19	1,073.06	5	5,143.81	1,028.76	639	150	175,502.09	1,170.01	18
24	133	9	12,829.09	1,425.45	137	3	4,275.25	1,425.08	3	4,633.27	1,544.42	522	39	54,800.89	1,405.15	24
25	79	..	.....	.....	61	..	.....	.....	..	.....	.....	311	..	.....	.....	25
38	48	8	8,990.91	1,123.86	39	5	4,993.57	998.71	7	7,946.84	1,135.26	304	37	38,306.47	1,035.31	38
17	54	..	.....	.....	49	..	.....	.....	..	.....	.....	233	..	.....	.....	17
19	113	..	.....	.....	100	..	.....	.....	..	.....	.....	528	..	.....	.....	19
21	...	..	.....	.....	...	..	.....	.....	..	.....	.....	74	3	2,573.48	857.83	21
22	67	8	7,951.28	993.91	65	2	2,060.17	1,030.09	..	.....	.....	316	26	25,295.25	972.89	22
36	78	1	1,113.33	1,113.33	77	..	.....	.....	1	1,391.25	1,391.25	308	8	9,421.05	1,177.63	36
8	48	7	8,050.88	1,150.13	46	1	1,249.89	1,249.89	10	10,971.14	1,097.11	196	37	38,727.60	1,046.69	8
10	29	2	1,807.95	903.98	30	2	1,905.66	952.83	3	2,044.00	681.33	140	28	22,725.51	811.63	10
12	58	34	30,614.24	900.42	68	4	4,208.28	1,052.07	1	1,235.50	1,235.50	241	94	84,803.05	902.16	12
16	72	1	1,738.52	1,738.52	70	..	.....	.....	..	.....	.....	283	2	3,138.89	1,569.45	16
23	...	..	.....	.....	...	..	.....	.....	..	.....	.....	82	14	13,659.44	975.67	23
29	41	1	861.10	861.10	37	1	544.82	544.82	..	.....	.....	159	3	2,289.17	763.06	29
35	49	22	27,129.38	1,233.15	59	23	32,951.91	1,432.69	..	.....	.....	245	107	136,339.05	1,274.20	35
37	...	..	.....	.....	...	..	.....	.....	..	.....	.....	110	..	.....	.....	37
1	...	..	.....	.....	...	..	.....	.....	..	.....	.....	103	16	17,882.67	1,117.67	1
20	...	..	.....	.....	...	..	.....	.....	..	.....	.....	66	..	.....	.....	20
2	33	1	693.81	693.81	30	..	.....	.....	..	.....	.....	162	1	693.81	693.81	2
3	73	9	9,700.98	1,077.89	87	14	15,532.11	1,109.44	..	.....	.....	371	68	75,801.66	1,114.73	3
31	75	5	5,344.18	1,068.84	43	34	34,242.40	1,007.13	..	.....	.....	308	56	54,540.32	973.93	31
32	103	7	8,988.64	1,284.09	100	18	27,031.34	1,501.74	5	6,596.31	1,319.26	432	47	61,319.46	1,304.67	32
5	51	8	8,463.70	1,057.96	43	4	4,568.42	1,142.10	..	.....	.....	205	33	34,569.22	1,047.55	5
33	...	..	.....	.....	...	..	.....	.....	1	715.09	715.09	61	17	14,408.12	847.54	33
9	87	22	25,528.22	1,160.37	78	2	2,464.82	1,232.41	..	.....	.....	370	77	80,722.53	1,048.34	9
26	60	9	9,136.48	1,015.16	45	..	.....	.....	1	714.10	714.10	227	15	14,661.58	977.44	26
30	43	..	.....	.....	49	..	.....	.....	..	.....	.....	193	..	.....	.....	30
	2,524	258	$302,134.80	$1,171.07	2,472	144	$178,957.70	$1,242.76	50	$61,956.67	$1,239.13	10,947	1,161	$1,350,300.11	$1,163.05	

however, the least is expended by juniors and the most by seniors in this subdivision.

The total annual expense, then, seems to fall lightest on sophomores and heaviest on seniors. It is exceedingly interesting to note that earnings show a gradual but steady increase from the low average for the freshman year to the high average for the senior year (table 5).

The geographic distribution indicates that student expenses are highest in the medical schools of the New England and Middle Atlantic states. The reported are more nearly represented by the bracket $600 to $1,600 inclusive. The median for this smaller group ranging from $600 to $1,600 inclusive is $1,107.27, and the average for this group is $1,125 (table 6 and chart 1).

TABLE 4.—*Cost of Medical Education, 1929-1930,*

	Medical Schools Arranged According to Geographic Subdivisions of the United States	College Enrolment	Reports Returned	Tuition and Fees			Med. Books, Insts. etc.			*Board and Room			Clothing and Laundry			
				No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	
	NEW ENGLAND															
7	Dartmouth Medical School	39	5	5	$2,101.25	$420.25	5	$565.92	$113.18	5	$2,844.31	$568.86	5	$748.91	$149.78	7
11	Harvard University Medical School	516	32	32	13,176.98	411.75	32	5,063.17	158.22	32	18,222.35	569.45	31	5,243.47	168.82	11
34	Vermont College of Medicine, Univ. of	156	22	22	8,244.26	374.74	22	1,698.94	77.22	22	8,422.83	382.85	22	2,628.73	119.49	34
40	Yale University School of Medicine	212	41	41	17,732.34	432.50	41	4,986.92	121.63	41	19,426.80	473.82	41	5,784.19	141.08	40
	MIDDLE ATLANTIC															
6	Columbia Univ. Coll. of Phys. and Surgs.	423	11	11	5,810.00	528.18	11	1,639.40	149.04	11	5,163.32	469.79	11	1,217.64	110.69	6
15	Jefferson Medical College of Philadelphia	586	78	78	33,127.07	424.71	78	6,560.22	84.10	78	35,000.06	448.72	77	9,524.46	123.69	15
27	Pittsburgh School of Medicine, Univ. of	260	39	39	16,491.83	422.87	39	4,815.15	123.47	39	17,891.75	458.76	39	6,538.43	167.65	27
28	Rochester School of Medicine, Univ. of	133	9	9	2,754.10	306.01	9	1,114.84	123.87	9	4,084.15	453.79	9	1,279.70	142.19	28
39	Woman's Medical College of Pennsylvania	116	10	10	3,717.75	371.78	10	1,107.35	110.74	10	3,674.88	367.49	10	1,103.49	110.35	39
	EAST NORTH CENTRAL															
4	Chicago, Rush Medical College, Univ. of	344	27	27	8,818.95	326.63	27	2,747.79	101.77	27	12,989.40	481.09	27	4,146.90	153.59	4
13	Illinois College of Medicine, University of	549	2	2	365.25	182.62	2	306.25	153.12	2	543.50	271.75	2	157.30	78.65	13
14	Indiana University School of Medicine	424	7	7	1,575.30	225.04	7	515.24	73.60	7	2,296.43	328.06	7	529.53	75.65	14
18	Michigan Medical School, University of	639	150	150	36,345.00	242.30	150	15,008.41	100.06	150	66,689.32	444.60	150	20,896.46	139.31	18
24	Northwestern University Medical School	522	39	39	14,571.53	373.63	39	4,712.86	120.84	39	19,406.93	497.61	39	4,793.24	122.90	24
25	Ohio State Univ. College of Medicine	311	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	25
38	Wisconsin Medical School, University of	304	37	37	4,698.15	126.98	37	2,498.57	67.53	37	15,783.30	426.58	37	6,186.84	167.21	38
	WEST NORTH CENTRAL															
17	Kansas School of Medicine, University of	233	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	17
19	Minnesota Medical School, University of	528	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	19
21	Missouri School of Medicine, University of	74	3	3	445.50	148.50	3	219.80	73.27	3	1,202.25	400.75	3	185.04	61.68	21
22	Nebraska College of Medicine, Univ. of	316	26	26	5,880.69	226.18	26	2,090.20	80.39	26	9,179.85	353.07	26	2,258.79	86.88	22
36	Washington Univ. School of Medicine	308	8	8	3,053.00	381.63	8	1,094.66	136.83	8	2,969.40	371.17	8	744.89	93.11	36
	SOUTH ATLANTIC															
8	Emory University School of Medicine	196	37	37	10,093.86	272.81	37	3,082.08	83.30	37	11,701.45	316.26	37	5,140.94	138.94	8
10	Georgia Medical Dept., University of	140	28	28	3,172.65	113.31	28	2,468.77	88.17	28	8,084.13	288.72	28	3,088.84	110.32	10
12	Howard University School of Medicine	241	94	94	24,676.01	262.51	94	8,275.85	88.04	94	25,817.53	274.65	94	13,095.73	139.32	12
16	Johns Hopkins Univ. School of Medicine	283	2	2	1,247.50	623.75	2	338.68	169.34	2	575.65	287.83	2	244.62	122.31	16
23	North Carolina School of Med., Univ. of	82	14	14	3,307.59	236.26	14	932.00	66.57	14	4,592.13	328.01	14	1,913.24	136.66	23
29	South Carolina, Med. College of State of	159	3	3	594.06	198.02	3	193.80	64.60	3	871.14	290.38	3	239.75	79.92	29
35	Virginia Dept. of Medicine, University of	245	107	107	32,722.35	305.82	106	18,418.99	173.76	107	43,018.84	402.05	107	15,836.88	148.01	35
37	West Virginia Univ. School of Medicine	110	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	37
	EAST SOUTH CENTRAL															
1	Alabama School of Medicine, Univ. of	103	16	16	3,736.00	233.50	16	3,021.20	188.83	16	5,148.60	321.79	16	2,162.43	135.15	1
20	Mississippi Medical School, University of	66	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	20
	WEST SOUTH CENTRAL															
2	Arkansas School of Medicine, Univ. of	162	1	1	212.90	212.90	1	143.45	143.45	1	273.50	273.50	1	50.46	50.46	2
3	Baylor University College of Medicine	371	68	68	21,127.12	310.69	67	5,469.19	81.63	68	22,381.20	329.14	68	10,305.02	151.54	3
31	Texas School of Medicine, University of	308	56	56	5,230.11	93.39	56	5,115.42	91.35	56	19,906.03	357.07	56	9,621.64	171.82	31
32	Tulane Univ. of Louisiana School of Med.	432	47	47	14,779.10	314.45	47	4,553.19	96.88	47	18,490.31	393.41	47	8,394.82	178.61	32
	MOUNTAIN															
5	Colorado School of Medicine, Univ. of	205	33	33	7,816.58	236.87	33	3,280.53	99.41	33	12,253.63	371.32	33	3,874.32	117.40	5
33	Utah School of Medicine, University of	61	17	17	3,349.89	197.05	17	1,668.35	98.14	17	5,114.69	300.86	17	1,398.38	82.26	33
	PACIFIC															
9	Evangelists, College of Medical	370	77	77	32,627.72	423.74	77	7,495.84	97.35	77	21,836.12	283.59	77	8,013.42	104.07	9
26	Oregon Medical School, University of	227	15	15	3,067.25	204.48	15	1,280.00	85.33	15	5,146.99	343.13	15	1,792.94	119.53	26
30	Stanford University School of Medicine	193	..	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	30
	Total	10,947	1,161	1,161	$346,669.64	$298.60	1,159	$122,483.03	$105.68	1,161	$451,092.77	$388.54	1,159	$159,131.44	$137.30	

TABLE 5.—*Cost of Medical Education, 1929-1930, by*

Period	Tuition and Fees			Medical Books, Insts., etc.			Board and Room			Clothing and Laundry			Travel		
	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average
First year	348	$108,961.50	$313.11	347	$45,318.56	$130.60	348	$133,370.74	$383.25	348	$41,801.85	$120.12	338	$21,741.19	$64.32
Second year	361	108,079.88	299.39	361	31,905.63	88.38	361	136,664.25	378.57	361	48,127.79	133.32	344	21,804.98	63.39
Third year	258	78,969.60	306.08	258	25,703.66	99.63	258	101,197.23	392.24	257	37,215.74	144.81	251	19,161.46	76.34
Fourth year	144	36,097.62	250.68	143	13,605.73	95.14	144	58,908.74	409.09	144	24,482.67	170.02	139	13,481.51	96.99
Unidentified	50	14,561.04	291.22	50	5,949.45	118.99	50	20,951.81	419.04	49	7,503.39	153.13	47	3,247.35	69.09
Total	1,161	$346,669.64	$298.60	1,159	$122,483.03	$105.68	1,161	$451,092.77	$388.54	1,159	$159,131.44	$137.30	1,119	$79,436.49	$70.90

The reports studied showed a wide range of expense intervals, from $424.99 for one freshman to $2,839.80 for one sophomore. Table 6 shows the distribution of the actual individual expenses by expense intervals or magnitude groups according to class periods and the geographic location of the school. The median for all reports is $1,120.86, the average $1,163.05. The table shows that the very low and exceedingly high amounts are relatively unusual. The total of these several items, therefore, distort the true median and average, which expenditures for the medical schools of the Pacific and Mountain states appear to be lowest. The expense for the schools of the South Atlantic states closely approaches the western averages. The percentage of the average total expense that is paid for each major expense item is shown in table 7 and chart 2. Board and room call for 33.4 per cent of the total, a general average expense of $388.54 annually. Tuition and fees represent 25.7 per cent of the total expense, averaging $298.60. These two items, it will be seen, call for 59

per cent of the student's annual expense. No attempt has been made to ascertain whether expenditures were in any instance exorbitant or unnecessary. However, when it is found that 50 per cent of the students reporting are meeting their necessary expenses with approximately $1,100 or less it becomes difficult to interpret the expenditures in the upper brackets, as high as $2,839, in terms of actual necessary college demands.

The results of one study, however, provide a few valuable figures that closely parallel the present investigation. These comparisons are given in table 8. The former study was made in 1920 by Dr. Irving S. Cutter and embodied data from eight medical schools. Figures from Dr. Cutter's study are given only in those instances in which his analysis and the present study approach the same classifications.

by Colleges According to Major Expense Items

	Travel			Insurance and Interest			Recreation			Miscellaneous			Total			Earnings			
	No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	No.	Amount	Average	
7	5	$700.71	$140.14	3	$296.96	$98.99	5	$767.66	$153.53	5	$558.04	$111.61	5	$8,583.76	$1,716.75	2	$874.28	$437.14	7
11	32	3,684.98	115.16	14	1,107.55	79.11	31	2,858.08	92.20	31	2,549.56	82.24	32	51,896.14	1,621.75	18	7,743.90	413.55	11
34	22	1,391.13	63.23	11	877.72	79.79	22	2,218.01	100.82	22	985.39	44.79	22	26,467.01	1,203.05	12	1,852.57	154.38	34
40	40	3,542.62	88.57	11	761.51	69.23	40	4,732.15	118.30	41	2,345.39	57.20	41	59,311.92	1,446.63	28	6,378.16	227.79	40
6	10	474.11	47.41	1	13.50	13.50	11	546.45	49.68	11	946.19	86.02	11	15,810.61	1,437.33	5	1,401.50	280.30	6
15	74	5,381.84	72.73	27	2,133.79	79.03	76	7,317.63	96.28	77	5,680.75	73.78	78	104,725.82	1,342.64	26	6,572.05	252.77	15
27	37	2,484.21	67.14	14	1,170.60	83.61	38	3,808.50	100.22	38	2,119.35	55.77	39	55,319.82	1,418.46	21	5,101.57	242.93	27
28	9	897.07	99.67	3	144.26	48.09	9	514.78	57.20	9	703.12	78.12	9	11,492.02	1,276.89	4	787.25	196.81	28
39	10	906.50	90.65	1	174.00	174.00	10	208.55	20.86	10	375.85	37.59	10	11,268.37	1,126.84	1	72.40	72.40	39
4	26	2,250.72	86.57	16	1,776.88	111.06	26	1,453.43	55.90	26	1,503.97	57.85	27	35,688.04	1,321.78	15	6,201.02	413.40	4
13	2	69.18	34.59	1	9.44	9.44	2	109.00	54.50	2	46.85	23.43	2	1,606.77	803.39	..	.....	.....	13
14	7	420.54	60.08	3	95.23	31.74	7	231.47	33.07	7	284.78	40.68	7	5,948.52	849.79	3	765.90	255.30	14
18	144	9,836.45	68.31	64	4,804.04	75.06	148	11,693.42	79.01	147	10,228.99	69.58	150	175,502.09	1,170.01	52	10,983.96	211.23	18
24	39	3,609.87	92.56	20	1,716.37	85.82	38	3,185.86	83.84	39	2,804.23	71.90	39	54,800.89	1,405.15	22	8,812.40	400.56	24
25	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	25
38	36	1,961.56	54.49	18	2,040.72	113.37	37	2,696.49	72.88	37	2,440.84	65.97	37	38,306.47	1,035.31	20	4,300.64	215.03	38
17	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	17
19	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	19
21	3	74.10	24.70	3	89.50	29.83	2	87.35	43.68	3	269.94	89.98	3	2,573.48	857.83	3	1,161.50	387.17	21
22	25	1,346.52	53.86	13	1,137.21	87.48	25	1,697.51	67.90	26	1,704.48	65.56	26	25,295.25	972.89	19	5,417.37	285.12	22
36	8	545.01	68.13	6	208.03	34.67	8	454.23	56.78	8	351.83	43.98	8	9,421.05	1,177.63	3	560.93	186.98	36
8	37	2,458.47	66.45	10	867.18	86.72	36	2,376.85	66.02	37	3,006.77	81.26	37	38,727.60	1,046.69	8	238.50	29.81	8
10	27	2,023.45	74.94	13	561.28	43.18	27	1,568.74	58.10	26	1,757.65	67.60	28	22,725.51	811.63	3	307.85	102.62	10
12	86	3,784.80	44.01	22	1,445.52	65.71	89	5,282.32	59.35	92	2,425.29	26.36	94	84,803.05	902.16	38	10,657.24	280.45	12
16	2	214.85	107.43	2	168.77	84.39	2	88.08	44.04	2	260.74	130.37	2	3,138.89	1,569.45	2	512.00	256.00	16
23	14	579.11	41.37	4	158.56	39.64	14	794.35	56.74	14	1,382.46	98.75	14	13,659.44	975.67	2	83.90	41.95	23
29	3	129.25	43.08	..	.....	.....	2	87.87	43.94	3	173.30	57.77	3	2,289.17	763.06	..	.....	.....	29
35	105	6,544.54	62.33	36	3,471.77	96.44	104	9,782.73	94.06	107	6,542.95	61.15	107	136,339.05	1,274.20	35	8,531.15	243.75	35
37	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	37
1	16	1,636.82	102.30	8	328.62	41.08	12	778.30	64.86	16	1,070.70	66.92	16	17,882.67	1,117.67	5	1,407.00	281.40	1
20	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	20
2	..	.....	.....	..	.....	.....	..	.....	.....	1	13.50	13.50	1	693.81	693.81	..	.....	.....	2
3	65	4,219.41	64.91	30	2,207.10	73.57	66	5,196.21	78.73	68	4,896.41	72.01	68	75,801.66	1,114.73	29	7,096.84	244.72	3
31	54	4,375.73	81.03	23	1,243.94	54.08	56	4,216.07	75.29	56	4,741.38	84.67	56	54,540.32	973.93	21	8,701.54	414.36	31
32	44	5,048.89	114.75	17	1,947.82	114.58	44	5,055.32	114.89	46	3,050.01	66.30	47	61,319.46	1,304.67	15	3,421.50	228.10	32
5	31	2,021.64	65.21	15	1,065.89	71.06	33	2,246.00	68.06	33	2,010.63	60.93	33	34,569.22	1,047.55	20	4,993.72	249.69	5
33	16	526.22	32.89	7	633.46	90.49	17	999.15	58.77	16	717.98	44.87	17	14,408.12	847.54	12	2,145.13	178.76	33
9	75	4,967.79	66.24	18	966.16	53.68	68	2,065.65	30.38	77	2,749.83	35.71	77	80,722.53	1,048.34	67	26,771.24	399.57	9
26	15	1,328.40	88.56	9	689.16	76.57	14	628.09	44.86	15	728.75	48.58	15	14,661.58	977.44	7	2,989.84	427.12	26
30	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	..	.....	.....	30
	1,119	$79,436.49	$71.63	443	$34,312.54	$77.45	1,119	$85,746.30	$76.63	1,148	$71,429.90	$62.22	1,161	$1,350,300.11	$1,163.05	518	$146,844.85	$283.48	

Class Periods According to Major Expense Items

Insurance and Interest			Recreation			Miscellaneous			Total			Earnings		
No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average	No. of Reports	Amount Reported	Average
109	$7,439.24	$68.25	333	$24,127.29	$72.45	340	$22,128.99	$65.09	348	$404,889.36	$1,163.48	132	$32,503.87	$246.24
137	9,789.83	71.45	348	25,286.46	72.66	360	20,702.76	57.51	361	402,361.58	1,114.58	171	47,769.75	279.36
111	7,655.95	68.97	251	17,698.20	70.51	258	14,532.96	56.33	258	302,134.80	1,171.07	126	36,150.06	286.91
69	7,405.84	107.33	140	14,094.33	100.67	143	10,881.26	76.09	144	178,957.70	1,242.76	74	25,661.80	346.78
17	2,021.68	118.92	47	4,540.02	96.60	47	3,181.93	67.70	50	61,956.67	1,239.13	15	4,759.37	317.29
443	$34,312.54	$77.45	1,119	$85,746.30	$76.63	1,148	$71,427.90	$62.22	1,161	$1,350,300.11	$1,163.05	518	$146,844.85	$283.48

There may be merit to the argument that college training, to be of greatest value, should embody something more than the gathering of facts from classroom and laboratory. If this is true and if there is a social or extramural training that requires some financial outlay, it may be that some of the students whose expenses fall in the lower brackets are denying themselves a legitimate part of the potential college benefits.

There have been few studies on this subject and therefore one cannot make the comparisons one wishes. It appears from this table that tuition and fees are the items that have increased most, more than 50 per cent. Books and instruments now cost about 50 per cent more than in 1920. On the other hand, board and room and clothing show a surprisingly slight rise and the expense for recreation has taken a decided decline.

All items for both studies cannot be shown, and the schools studied in the two reports differ; but the average total expense for all the schools studied shows

an increase now of $273.39 over 1920-1921. No attempt has been made to reconcile these figures with the change in value of the dollar over the past ten years.

schools averages slightly more than $1,100. Tuition and fees and board and room call for 59 per cent of the average total expense. Costs seem to be highest in the schools of the New England and Middle Atlantic states

TABLE 6.—*Cost of Medical Education, 1929-1930, by Expense Intervals According to Class Periods and Geographic Distribution*

	Class Periods						Geographic Distribution									
	First Year	Second Year	Third Year	Fourth Year	Unidentified	Total	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Less than 500	1	1	..	..	..	2	..	..	1	..	..	..	1	..	..	2
500 to 599	4	2	1	1	1	9	..	..	..	..	7	..	..	1	1	9
600 to 699	10	10	5	1	..	26	..	..	6	..	14	..	2	3	1	26
700 to 799	31	20	21	7	4	83	..	..	14	3	38	1	11	5	11	83
800 to 899	29	56	23	15	4	127	..	2	25	10	41	..	24	8	17	127
900 to 999	42	56	26	17	2	143	8	7	28	6	35	3	33	13	10	143
1,000 to 1,099	41	52	34	15	9	151	5	12	32	6	39	6	18	8	25	151
1,100 to 1,199	39	43	49	13	5	149	12	22	41	7	26	2	25	3	11	149
1,200 to 1,299	45	37	29	17	7	135	14	21	35	2	30	2	20	6	5	135
1,300 to 1,399	28	34	16	18	6	102	10	24	22	2	18	1	18	2	5	102
1,400 to 1,499	27	18	14	12	2	73	9	19	15	1	18	..	9	..	2	73
1,500 to 1,599	19	13	18	7	3	60	10	24	16	..	10	..	..	..	..	60
1,600 to 1,699	16	7	8	9	1	41	11	6	12	..	3	..	6	1	2	41
1,700 to 1,799	5	5	4	4	..	18	5	3	5	..	1	1	3	..	..	18
1,800 to 1,899	2	2	3	2	1	10	5	1	3	..	..	.	..	..	1	10
1,900 to 1,999	3	2	3	1	2	11	3	4	2	..	2	..	..	..	..	11
2,000 to 2,099	3	..	2	3	1	9	2	1	1	..	3	..	1	..	1	9
2,100 to 2,199	2	1	2	..	1	6	3	1	2	..	..	..	..	..	..	6
2,200 to 2,299	..	1	..	..	1	2	1	..	1	..	..	..	..	..	..	2
2,300 to 2,399	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2,400 to 2,499	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1
2,500 to 2,599	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2,600 to 2,699	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2,700 to 2,799	..	..	..	2	..	2	..	..	1	..	..	..	1	..	..	2
2,800 to 2,899	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	1
Total	348	361	258	144	50	1,161	100	147	262	37	285	16	172	50	92	1,161

TABLE 7.—*Percentage of Item Expenditures to Total Cost by Magnitude Groups According to Major Items of Medical Education Cost*

Group Magnitude	Tuition and Fees	Medical Books, Instruments, etc.	Board and Room	Clothing and Laundry	Travel	Insurance and Interest	Recreation	Miscellaneous	Total Reports	Total Per Cent
Less than $500	25.79 %	6.01 %	47.48 %	4.75 %	9.51 %	.....	2.18 %	4.28 %	2	100 %
$500 to $599	29.05 %	9.35 %	36.42 %	10.36 %	5.24 %	1.06 %	3.48 %	5.04 %	9	100 %
$600 to $699	30.54 %	9.17 %	37.11 %	9.57 %	4.89 %	0.87 %	4.00 %	3.85 %	26	100 %
$700 to $799	28.93 %	8.42 %	37.05 %	10.29 %	4.02 %	1.95 %	4.77 %	4.57 %	83	100 %
$800 to $899	27.68 %	8.73 %	36.65 %	11.26 %	4.33 %	1.41 %	4.88 %	5.06 %	127	100 %
$900 to $999	27.23 %	8.96 %	35.03 %	11.97 %	4.30 %	1.93 %	5.19 %	5.39 %	143	100 %
$1,000 to $1,099	27.16 %	9.40 %	34.44 %	11.35 %	5.28 %	1.87 %	5.80 %	4.70 %	151	100 %
$1,100 to $1,199	27.50 %	8.90 %	33.03 %	11.67 %	5.39 %	2.27 %	5.72 %	5.52 %	149	100 %
$1,200 to $1,299	25.85 %	9.70 %	33.31 %	11.05 %	6.13 %	2.61 %	6.09 %	5.26 %	135	100 %
$1,300 to $1,399	25.41 %	9.02 %	32.17 %	11.75 %	5.94 %	2.06 %	7.32 %	6.33 %	102	100 %
$1,400 to $1,499	24.67 %	9.21 %	32.49 %	12.39 %	6.52 %	2.12 %	7.03 %	5.57 %	73	100 %
$1,500 to $1,599	23.39 %	8.73 %	32.73 %	12.21 %	6.26 %	3.89 %	7.88 %	4.91 %	60	100 %
$1,600 to $1,699	21.60 %	8.79 %	31.56 %	12.88 %	8.09 %	4.76 %	7.37 %	4.95 %	41	100 %
$1,700 to $1,799	23.07 %	9.11 %	30.07 %	10.68 %	7.12 %	3.70 %	8.27 %	7.98 %	18	100 %
$1,800 to $1,899	20.34 %	6.93 %	32.15 %	12.91 %	9.44 %	4.24 %	9.33 %	4.66 %	10	100 %
$1,900 to $1,999	20.22 %	8.53 %	29.45 %	12.56 %	8.01 %	6.62 %	11.01 %	3.60 %	11	100 %
$2,000 to $2,099	17.10 %	10.26 %	25.74 %	16.59 %	11.11 %	4.04 %	11.13 %	4.03 %	9	100 %
$2,100 to $2,199	18.82 %	8.72 %	30.87 %	20.30 %	7.57 %	2.71 %	5.67 %	5.34 %	6	100 %
$2,200 to $2,299	18.11 %	10.06 %	20.60 %	8.53 %	15.36 %	9.40 %	8.04 %	9.90 %	2	100 %
$2,400 to $2,499	16.20 %	19.21 %	25.78 %	12.71 %	11.00 %	.....	3.90 %	11.20 %	1	100 %
$2,700 to $2,799	13.05 %	11.25 %	27.27 %	14.59 %	10.09 %	13.05 %	6.91 %	3.79 %	2	100 %
$2,800 to $2,899	20.25 %	8.30 %	23.60 %	15.36 %	24.14 %	.....	6.84 %	1.51 %	1	100 %
Number of reports	1,161	1,159	1,161	1,159	1,119	443	1,119	1,148	1,161	
Amount reported	$346,669.64	$122,483.03	$451,092.77	$159,131.44	$79,436.49	$34,312.54	$85,746.30	$71,427.90	$1,350,300.11	
Per cent of total	25.67 %	9.07 %	33.41 %	11.79 %	5.88 %	2.54 %	6.35 %	5.29 %		100 %

TABLE 8.—*Comparison of Costs of Medical Education According to Certain Major Expense Items, 1920-1921 and 1929-1930*

	Tuition and Fees		Books, Journals, Insts. etc.		Board and Room		Clothing and Laundry		Recreation		Total		Earnings	
Medical School	1920-21	1929-30	1920-21	1929-30	1920-21	1929-30	1920-21	1929-30	1920-21	1929-30	1920-21	1929-30	1920-21	1929-30
Indiana University School of Medicine	$162.36	$225.04	$62.47	$73.60	$360.32	$328.06	$106.79	$75.65	$90.36	$33.07	$787.93	$849.79	$312.85	$255.30
University of Michigan Medical School	167.83	242.30	79.87	100.06	432.74	444.60	136.55	139.31	128.01	79.01	1,027.77	1,170.01	297.87	211.22
University of Nebraska College of Medicine	135.49	226.18	68.16	80.39	386.18	353.07	122.46	86.88	125.43	67.90	871.04	972.89	330.11	285.12
University of Virginia Department of Medicine	190.43	305.82	60.57	173.76	371.27	402.05	124.48	148.01	114.24	94.06	882.28	1,274.20	248.42	243.75
General average for all schools studied	$187.16	$298.60	$68.97	$105.68	$370.10	$388.54	$121.40	$137.30	$110.20	$76.63	$889.66	$1,163.05	$268.84	$283.48

SUMMARY

The cost of medical education to the student for 1929-1930 shown by the reports of 1,161 students attending widely separated and various types of medical schools averages slightly more than $1,100. Tuition and fees and board and room call for 59 per cent of the average total expense. Costs seem to be highest in the schools of the New England and Middle Atlantic states and most reasonable in the schools of the Pacific and Mountain states, with the South Atlantic states following closely.

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SATURDAY, FEBRUARY 28, 1931

THE COSTS OF MEDICAL EDUCATION

Elsewhere in this issue appears a report by Dr. R. G. Leland of an investigation into the costs of medical education. This investigation was stimulated by the Committee on the Costs of Medical Care and is one of several investigations undertaken by the American Medical Association at its own expense in order to supply facts relative to medical economics not heretofore available.

Many estimates have been ventured by various observers as to the amount of money spent by the average young man—or in many instances no doubt by his parents—in order to provide him with a medical education. The impression has been that the cost is approximately $1,000 a year for tuition and maintenance. The investigation made by Dr. Leland reveals the actual sum spent by the student in any year as $1,100, this including tuition and fees, books and periodicals, board and room, clothing and laundry, and recreation. In 1920, by contrast, the amount was almost $900. The figures submitted do not include the cost of premedical education or such expenses as may be incurred during the term of internship that is required by all colleges and most state licensing boards. Neither do the figures take into account the interest on the investment or the amount of money the young man might have earned were he in a gainful occupation rather than in a professional school. At the lowest possible estimate, apparently, a medical education must cost at least $5,000, and, if all the factors are taken into account, may cost in actual cash expended as much as $10,000. If possible earnings and interest are added, the cost may actually reach $20,000. It is doubtful whether there is any other occupation in which men engage in which the cost of training is so great. Certainly there is no other vocation in which the time spent to reach efficiency is so extended. The gradual lengthening of the medical curriculum through the demands for premedical education, for internship and for special training has prolonged the infancy of the young man in medicine to almost thirty years. The human infant at best has the longest period of infancy of any living species. Whereas many animals are competent to take care of themselves and, indeed, to produce families one week after birth, the human infant is not competent to take care of himself until from eighteen to twenty years after birth. If he embarks on a professional vocation, the period is extended to thirty years. From the point of view of the biologist, it is doubtful whether this is a sound trend in human life. The persons most likely to produce progeny capable of raising the intellectual if not the physical standard of the race postpone their maturity beyond the age when biologists are convinced that optimal conditions exist for reproduction.

Beyond these biologic and sociological considerations are the economic factors. If the sum represented by the cost of a medical education were properly invested for a young man at the age of 20 years, he would have at 50 years an income capable of maintaining him in comfort for the rest of his life. Possibly the studies now being made on the incomes of physicians will indicate that the income of the physician at 50 years is seldom sufficient to maintain him in reasonable comfort for the remainder of his existence. Indeed, it is a question whether the average income of the physician represents a reasonable return on the cost of the education.

With these considerations in mind, it is interesting to turn to one of the latest promulgations on the subject of higher education. Mr. Abraham Flexner, who has given much thought to medical education and who is no doubt to be credited considerably for the prevailing high standards, has recently summarized his views in a volume entitled "Universities: American, English, German." The time is perhaps not yet propitious for such a summary in view of the fact that many of the changes in medical education for which Mr. Flexner is largely responsible seem to be at this moment in a state of such agitation that even the most optimistic observer might be doubtful as to what the precipitate will be. Mr. Flexner is, of course, more interested in maintaining high standards of teaching and research than in the education of physicians to take care of the majority of the people. Indeed, he conveys the impression that there is not a medical school in the country that really comes up to the standards he thinks necessary for a medical school. Mr. Flexner is convinced that there can be no medical school worthy of the name without sufficient endowment to make its faculties entirely independent from other sources. One is inclined to the opinion that a further advance in the cost of medical education might well bring about the point of view that a sufficient endowment is necessary to make the students absolutely independent of any income from personal earnings or their parents, if they are to complete the curriculum in a school of the

Flexner standard. The absurdity of the entire discussion becomes apparent when Mr. Flexner, in one of his sapient sentences, figuratively bites the hand that feeds him: "On the other hand, in England, as in America and the rest of the world, wealth may still triumph over reason: neither we nor they nor others have found effective means of putting the idle and stupid rich in their proper place."

The recent conference on medical education held under the auspices of the Council on Medical Education and Hospitals of the American Medical Association indicated that the problems of medical education are by no means settled. The curriculum still remains the subject of more or less confused discussion. The time spent by young men in professional schools is obviously too long, and it seems quite reasonable to propose that men sufficiently advanced in years to engage in professional study do not require a three or four months vacation but might well shorten their time by occupying at least eleven months of the year in study. It is questionable whether the cost of medical education can be greatly reduced, and certainly the demands on the student as shown by the figures presented by Dr. Leland are such that his actual earnings by outside work can hardly be counted on to be of much value. The presentation of facts in Dr. Leland's article is again proof of the necessity of more actual evidence in this field on which to base discussions rather than of any attempt to settle these problems by armchair philosophers and unpractical idealists.

STATISTICAL STUDIES OF DEAF CHILDREN

Shambaugh and his associates [1] have recently completed a comprehensive study of 5,348 children in institutions for the deaf. Similar studies have not been attempted before, although Newhart [2] and others have studied children in public schools for evidences of deafness. Shambaugh's study consists of an analysis of the history and a complete aural examination of each patient. Sixty-two per cent of the children were found to be congenitally deaf. More than half of the cases of acquired deafness occurred before the age of 3. Shambaugh declares that probably a large proportion of the group of acquired deafness are really congenital, since parents desire to escape the stigma of having given birth to deaf children and because deafness is often not definitely established until the age of 3. The statistics show that severe deafness in children is acquired in almost all cases before the age of 10. Meningitis was responsible for almost one fifth of the cases of acquired deafness, while measles caused 8.5 per cent and scarlet fever and influenza each caused 7 per cent. There was an accompanying suppurative otitis media in many cases. The study revealed that hearing or vestibular responses were present in most cases in which there had been suppurative otitis media. The authors believe that suppurative otitis media, if it invades the inner ear, will destroy all vestiges of hearing and vestibular responses. They conclude that the deafness may result from a toxic neuritis developing independently of the otitis rather than from an extension of the suppurative process into the inner ear. They declare that tonsils and adenoids "can be responsible for a severe deafness only through an otitis media that has invaded the labyrinth—a negligible factor in this series."

Hereditary syphilis apparently causes but few cases of acquired deafness. Wassermann reactions were positive in only two of the 396 cases tested. A family history of deafness or of consanguinity was found in more than a third of the cases of congenital deafness. The common assumption that in congenital deafness the vestibule is not involved was disproved when it was shown that two thirds of this group gave diminished or absent vestibular responses. Vestibular responses were absent in both the congenital and the acquired groups in the same proportion whether partially or totally deaf. Three fifths of the entire group had a speech defect so pronounced that the untrained listener had difficulty in understanding the child.

While such a study may have many errors because data must be collected from whatever histories are available, the large number of cases should nullify gross errors. The great majority of cases of deafness requiring institutional care are apparently congenital. That heredity is an active factor in the production of congenital deafness is indicated by the large number of cases of deafness in the immediate family. Shambaugh declares that persons from families with congenital deafness should not bear offspring. Probably congenital deafness will continue to be prevalent as long as eugenic marriage is not practiced. In this study there were 232 patients whose parents were relations by blood, yet only 17 per cent gave a history of deafness in the family. It would seem from this result that intermarriage, even between distant relatives, tends to summate and bring out remote hereditary defects in hearing. Shambaugh's belief that a suppurative process of the inner ear must necessarily destroy completely hearing and vestibular responses requires confirmation. Careful studies of the inner ear in cases of severe deafness with a history of suppurative otitis media would do much to settle the point. The faithful use of measures now available for the treatment of the infectious diseases, especially meningitis and scarlet fever, might help much to lessen the incidence of acquired deafness.

1. Shambaugh, G. E.; Hall, Alice K.; Hagens, E. W., and Holderman, J. W.: Statistical Studies of the Children in the Chicago Public Schools for the Deaf, Arch. Otolaryng. **2**: 417 (Nov.) 1925; Supplementary Statistical Studies of the Children in the Chicago Public Schools for the Deaf, ibid. **5**: 209 (March) 1927. Shambaugh, G. E.; Hagens, E. W.; Holderman, J. W., and Watkins, R. W.: Statistical Studies of the Children in the Public Schools for the Deaf, ibid. **7**: 424 (May) 1928. Shambaugh, G. E.; Hayden, D. B.; Hagens, E. W., and Watkins, R. W.: Statistical Studies of the Children in Public Schools for the Deaf, ibid. **12**: 190 (Aug.) 1930.

2. Newhart, Horace: Progress in the Prevention of Deafness, J. A. M. A. **93**: 1117 (Oct. 12) 1929.

LIMITATIONS OF BACTERIOPHAGE THERAPY

The "d'Herelle phenomenon" has been the subject of 2,000 published papers since it was first described in 1915 by Twort.[1] As yet but little agreement has been reached as to the mechanism of action of the bacteriophage and there is no reliable guide to the practical limitations of therapy by its use. The chief factor contributing to this uncertainty has been the lack of a dependable quantitative method. Last year, Dr. A. P. Krueger[2] of the Rockefeller Institute, Princeton, N. J., devised a quantitative technic by means of which for the first time bacteriophage could be estimated with an accuracy of ± 3 per cent. Using this new technic, Drs. Krueger and Northrop[3] studied the kinetics of the bacterium-bacteriophage mixture. Their revolutionary results seem to prove that future theories must be developed along radically different lines from those suggested by any previous investigator and that future therapy must be limited to certain definite anatomic types of infection.

Drs. Krueger and Northrop were unable to find the least evidence that the transmissible lysin of Twort is a living biologic entity. During the stages preceding explosive bacterial lysis there is no evidence that ordinary amounts of bacteriophage exert any physiologic or pathologic effects on the bacterium. It neither stimulates nor retards bacterial growth. Proliferation of the Twort lysin is intimately linked with bacterial multiplication. The bacteriophage is formed within the bacterial cell and diffuses outward at such a rate that extracellular concentration and intracellular concentration of bacteriophage maintain to each other a constant mathematical ratio. This is a type of distribution common to simple chemical substances but one hardly to be expected if the bacteriophage is a complex vital unit. When a certain critical ratio between bacterium and extracellular bacteriophage is attained, bacterial multiplication ceases and bacterial dissolution begins.

Krueger and Northrop have developed mathematical equations that accurately predict all the major events of this relationship, including the rate of bacterial growth, the rate of bacteriophage formation, time of lysis, and concentration necessary for bacteriostasis. In their practical bearing the Krueger-Northrop equations mean that a certain critical concentration of extracellular bacteriophage is essential for bacteriolysis, in about the same way that a critical environmental carbon dioxide concentration is necessary for death from carbon dioxide autointoxication. This means that no therapeutic effects whatever are predictable for bacteriophage, except under conditions in which local extrabacterial bacteriophage concentration can be raised to and maintained at this critical level. This can be done either by direct introduction of massive doses of bacteriophage or by allowing free bacterial growth in the presence of smaller doses. Such a critical extrabacterial concentration could hardly be expected in any tissue in which extracellular bacteriophage is denatured, bound, removed or diluted by such factors as circulation, lymph flow or urinary secretion. Bacteriophage therapy, therefore, would be a predictable disappointment in erysipelas, furunculosis, pneumonia, pyelitis, cellulitis and bacteremia, and in cystitis except by concentrated irrigation. The use of this therapy would thus be practically limited to such closed organs as the intestine and to well encapsulated pus cavities. If bacteriophage should prove to be the therapy of choice in but one of these conditions, it would amply repay for the past fifteen years of false starts and clinical disappointments.

1. Twort, F. W.: An Investigation of the Nature of Ultramicroscopic Viruses, Lancet **2**: 1241 (Dec. 4) 1915; Filter-Passing Transmissible Bacteriolytic Agents (Bacteriophage), ibid. **2**: 1064 (Nov. 15) 1930.
2. Krueger, A. P.: A Method for the Quantitative Determination of Bacteriophage, J. Gen. Physiol. **13**: 557 (May 20) 1929.
3. Krueger, A. P., and Northrop, J. H.: The Kinetics of the Bacterium-Bacteriophage Reaction, J. Gen. Physiol. **14**: 223 (Nov. 20) 1930.

Current Comment

THERAPEUTIC POSSIBILITIES OF GASTRIC MUCIN

The variegated manifestations of the common cold and its analogues include extensive mucous secretions and expectorations. Mucus is derived not only from the nasopharynx or other parts of the respiratory tract but also from the other mucous membranes. Mucus usually awakens memories of a thoroughly objectionable product of disordered membranes. Nevertheless it is mostly a blessing to the human economy. It catches and holds many objectionable invaders; it makes possible a more comfortable passage of otherwise irritating food masses along the many feet of the gastro-intestinal canal; it smooths over the roughened edges of injurious objects, such as glass and iron particles, that have found their way down the esophagus. The compensatory virtues of mucus are moreover not fully covered by the recital of such physical functions, for its components are distinctly antacid in character. Thus the gastric mucus aids in protecting the cells from digestive or "erosive" damage by the acid that is poured into the lumen of the stomach when the gastric glands are active. Undue secretion of mucus in the stomach is responsible for lowering of the gastric acidity, just as proteins tend to "bind" free hydrochloric acid. The actual capacity of mucus to produce such an effect has been verified by Fogelson[1] at the Northwestern University Medical School. Mucin prepared from hogs' stomachs was more potent than equivalent amounts of common protein foods such as gelatin, meat and egg white. The use of the product in a few human patients with definite histories of ulcer and typical roentgenographic evidence of peptic ulcer was interesting. In addition to the customary bland diet, an ounce of powdered mucin was added to each meal and about 1 Gm. of mucin in tablet form given

1. Fogelson, S. J.: The Treatment of Peptic Ulcer with Gastric Mucin, Proc. Soc. Exper. Biol. & Med. **28**: 138 (Nov.) 1930; THE JOURNAL, this issue, page 673.

hourly. All these patients were relieved of subjective symptoms within three days of treatment. There was no recurrence of pain for many weeks. The history of the treatment of peptic ulcer with its stories of remissions under all manner of treatments is too familiar to warrant any undue enthusiasm about any novelty, however well authenticated. In any event, this research lends a little new dignity to a much despised physiologic substance.

DEFICIENCY OF VITAMIN AND TOXEMIA

The expression "toxemia" is drawn into service at present as an explanation for a variety of manifestations of disease for which no clearer interpretation is available. At one time or another several of the glands of the organism, such as the thyroids or adrenals, have been alleged to be connected in function with the destruction or detoxication of hypothetic "poisons," usually assumed to be endogenous in character. In the failure of the normal behavior of the glands the resulting disorder was quite naturally, though by no means always logically, attributed to a "toxemia." This sort of explanation has been applied to the appearance of neuritic symptoms in cases of deficiency of vitamin B. As Cowgill [1] has recently pointed out, the startling cures that occur following the administration of vitamins to so-called polyneuritic pigeons, in which nerve degeneration can be demonstrated so readily, can hardly be explained as due to sudden correction of the degenerative changes in nerves. This has led many investigators to favor the idea of toxemia. It has been suggested, he adds, that the toxins may be ingested with the food, developed from the materials in the alimentary tract, or be the result of a deranged tissue metabolism. One of the methods supposed to relieve such a condition consists in "washing out" the system by liberal intake of water and producing a vigorous diuresis. This process is sometimes accelerated by the parenteral administration of fluid. The plan has been put to the test in the laboratory of physiologic chemistry at Yale University by Cowgill and his collaborators in the case of animals deprived of their optimal intake of vitamin B by a selected regimen. When they were given large amounts of water by mouth it was found, contrary to what might be anticipated, that the time required for the appearance of the anorexia characteristic of a lack of this dietary essential was markedly shortened. Instead of being protected, the animals were invariably rendered more susceptible to the deficiency in the vitamin. Cowgill points out that this result is not in harmony with the hypothesis that the symptoms of a deficiency of vitamin B are essentially those of a toxemia. The urge to eat was restored by administration of mixtures of (undifferentiated) vitamin B. An explanation of the early symptoms when fluids are forced by mouth may be found in the possible removal by diuresis of vitamin still present in the body. If this is correct, it may lead to a better therapy of infants suffering from anorexia and anhydremia. Cowgill suggests that one phase of the treatment which these infants often receive, namely, subcutaneous, intravenous and rectal administration of fluids, may actually be detrimental in that it washes vitamin B from an already partially depleted body. It seems logical, in the light of the experiments here reported, to combine the recognized and approved methods of treatment of such cases of marasmus with the administration of some potent source of vitamin B. Certainly sufficient evidence is at hand, he concludes, that trials of such therapy are warranted. In any event the vague assumption of an existing "toxemia" may no longer be entirely sufficient to the clinician.

1. Cowgill, G. R.; Rosenberg, H. A., and Rogoff, J.: Studies in the Physiology of Vitamins: XIV. The Effect of Administration of Large Amounts of Water on the Time Required for Development of the Anorexia Characteristic of a Deficiency of the Vitamin B Complex, Am. J. Physiol. 95: 537 (Dec.) 1930.

Association News

CONTRIBUTIONS FOR MEDICAL SALON IN PERSHING HALL

The sum contributed this week for the Pershing Memorial in Paris brings the total to $2,057.60. A list of those who have contributed during the current week follows:

Charles A. Ley, M.D., Pittsburgh
M. S. Henderson, M.D., Rochester, Minn.
G. E. Campbell, M.D., Pasadena, Calif.
C. W. Way, M.D., Sea Isle City, N. J.
George J. Ewell, M.D., Madison, Wis.
Robert B. Sweet, M.D., Long Beach, Calif.
M. P. Messinger, M.D., Oakfield, N. Y.
John W. Goodheart, M.D., Bellingham, Wash.
Hill F. Warren, M.D., New London, Conn.
L. H. Wilmoth, M.D., Lander, Wyo.
John W. Abbott, M.D., Worcester, Mass.
W. I. Devers, M.D., Upland, Neb.
Pierre Higgins, M.D., Fort Worth, Texas
Adam J. Gates, M.D., Tigerton, Wis.
Moses de Ford, M.D., Philadelphia
Michael M. Wolfe, M.D., Philadelphia
Robert O. Blood, M.D., Concord, N. H.
Edward B. Bigelow, M.D., Worcester, Mass.
Harlow Brooks, M.D., New York
R. J. Newman, M.D., Ward Line, N. Y.
Staff of St. Joseph's Hospital, Waverly, Iowa
L. Dale Huffman, M.D., Los Angeles
William Gerry Morgan, M.D., Washington, D. C.
P. F. Metz, M.D., Thermopolis, Wyo.
James J. Waring, M.D., Denver
D. E. Little, M.D., Eufaula, Okla.
Jesse Schepps, M.D., Brooklyn
S. M. Davenport, M.D., Kingston, Pa.
J. E. Garces, M.D., Amarillo, Texas
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Arthur H. Gross, M.D., Bellevue, Pa.
Arvine E. Mozingo, M.D., Indianapolis
James L. Hamner, M.D., Mannboro, Va.
Baxter L. Crawford, M.D., Philadelphia
George B. Fletcher, M.D., Hot Springs, Ark.
David Chester Brown, M.D., Danbury, Conn.

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Hints

The American Medical Association broadcasts at 10 a. m. on Monday, 10:45 on Tuesday, 9:15 on Thursday and 10:30 on Saturday, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week is as follows:

March 2. The Sequel of Some Colds.
March 3. The Mental Grading of Children.
March 5. Some Facts About Yeast.
March 7. Practicing Health in Our Schools.

Five Minute Health Talks may be heard over the Columbia Broadcasting System daily except Sundays and holidays from 12 to 12:05 p. m.

The program for the week is as follows:

March 2. Man's Marvelous Machinery.
March 3. Hygiene.
March 4. Old Age.
March 5. Figures in American Medicine.
March 6. Sleep.
March 7. Sleep.

Recently the number of stations on the Farm Community Network have been increased. The stations over which the noon talks may now be heard are as follows: WBBM, Chicago; WCCO, Minneapolis; WNAX, Yankton, S. D.; KOIL, Council Bluffs, Iowa; WMT, Waterloo, Iowa; KSCJ, Sioux City,

Iowa; KFH, Wichita, Kan.; WIBW, Topeka, Kan.; KMBC, Kansas City, Mo.; KMOX, St. Louis; WFBM, Indianapolis; WKRC, Cincinnati; WLAP, Louisville, Ky.; WDSU, New Orleans; KLRA, Little Rock, Ark.; WREC, Memphis, Tenn.; WLAC, Nashville, Tenn.; WDOD, Chattanooga, Tenn.; WBRC, Birmingham, Ala.; WGST, Atlanta, Ga.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Edward A. Boyden, Ph.D., professor of anatomy, University of Alabama School of Medicine, has been appointed to a similar position at the University of Minnesota School of Medicine, succeeding Richard E. Scammon, Ph.D.; Dr. Boyden will move to Minnesota, June 1.——Mr. W. T. Fales, director, bureau of vital and mortuary statistics, state department of health, has been appointed by the Rockefeller Foundation, it is reported, to cooperate with the Roumanian government in developing its vital statistics. Mr. Fales was to have sailed February 4.

ARKANSAS

Bills Introduced.—H. 357 requires all practitioners of the healing art to respond to all calls for their services. If the patients are not able financially to pay for any service, physicians are to be allowed a reasonable fee, to be paid out of the county general fund. S. 317 proposes, in effect, to exempt osteopaths from the provisions of the basic science law. S. 323 proposes to repeal the basic science law.

CALIFORNIA

New Student Hospital.—The new Ernest V. Cowell Memorial Hospital of the University of California has recently been completed. It is five stories high and incorporates an outpatient dispensary, administrative offices, laboratories and hospital. The students indicate in writing the service desired and the records of the complete physical examination given to all students on matriculation are dispatched to the physician's office to which the patients are assigned. The two lower floors are devoted to administration, waiting and treatment rooms, laboratories and storage rooms. The three upper floors are for hospital purposes and have a capacity of 100 beds. There are eleven wards of four beds each. The fifth floor contains on the east end a suite for the resident physician, a ward and a sewing room, while the west end is devoted to surgery. The building is for sick students at the university, its objective being to show what can be accomplished by scientific preventive and curative medicine, and to reduce absenteeism from classes because of illness. The Cowell Memorial Hospital was named in honor of an alumnus who willed a sum sufficient to pay for the greater part of the building. Dr. Robert T. Legge is the university physician. The professional staff consists of a medical director and twenty-eight physicians. During the fiscal year ended June 30, 1930, 70,824 dispensary treatments were given and 954 bed patients were confined to the hospital.

COLORADO

Society News.—The recently organized Denver Urological Society elected Dr. Harry H. Wear, 915 Republic Building, Denver, secretary.

Bills Introduced.—S. 341 and H. 149 propose to require that all pupils and teachers be immune to smallpox before they attend or teach school. This immunity may be evidenced by (1) having had smallpox, (2) having been successfully vaccinated within five years, or (3) having been vaccinated three times unsuccessfully. H. 78 proposes to require all hospitals, sanatoriums, maternity or lying-in institutions and other institutions for the care of the sick or injured to be licensed by the state board of health. H. 403 proposes to make it the duty of physicians, nurses, midwives or other persons who assist or are in charge at the birth of infants to instil into the eyes of infants, within one hour after birth, a prophylactic approved by the state board of health.

CONNECTICUT

Bills Introduced.—H. 982, to amend the Pharmacy Practice Act, proposes to allow any person, firm or corporation holding a license from the commission of pharmacy to sell drugs in original packages as compounded by a licensed pharmacist, to designate the place of sale as a "package drug store." H. 414 proposes to provide (1) that no private institution for the mentally deficient shall receive as a patient any person afflicted with tuberculosis or any other communicable disease or any patient from outside the state, (2) that the attendants in any such institution must have the training of practical nurses, and (3) that inspection of such institutions be made by the state at least once in three months. H. 654, to amend the dental practice act, proposes to add to the causes for which a license may be revoked (1) "the publication or circulation of fraudulent or misleading statements by a licentiate, or his agents, concerning the licentiate or his employees, or concerning the skill or method or technique of any person or operator, or concerning the employment of accessory agents such as anesthetics or drugs or materials by any person or operator," and (2) "the conviction of any crime involving moral turpitude." H. 979 proposes to grant a license to Ellery G. Peckham of Stamford to practice naturopathy. S. 212 proposes that any licensed nurse who lives outside the state or who practices nursing wholly without pay or material compensation shall register annually with the state department of health but shall not be required to pay an annual registration fee. S. 444 proposes to authorize the state to pay to any charitable institution, hospital or home for the aged, not operated for profit or gain and not receiving state aid, $10 a week for each poor and indigent patient suffering from a chronic and incurable disease and treated in such hospital.

DELAWARE

Bill Introduced.—H. 129 proposes to create a board of examiners of beauticians and to regulate the occupation of beauty culture.

FLORIDA

Sentenced to Penitentiary.—Dr. Francis K. Armstrong, Fort Myers, was found guilty of manslaughter, Dec. 13, 1930, as the result of an illegal operation at his private hospital, Oct. 13, 1930. According to the state board of medical examiners, Dr. Armstrong was denied a new trial and sentenced to serve ten years in the state penitentiary.

Personal.—At the annual state public health conference, held in Jacksonville, Dec. 8-10, 1930, a portrait of the late Dr. Joseph Y. Porter, Sr., first state health officer, was presented to the state board of health by his family. Dr. Joseph N. Fogarty, Daytona Beach, made the presentation address and Dr. H. Mason Smith, Tampa, president of the state board of health, the speech of acceptance.

GEORGIA

Personal.—Dr. Frank Z. Story, Millen, has resigned as health commissioner of Jenkins County.——Dr. Owen F. Moran succeeded Dr. Lucius A. Bailey as health officer of Baldwin County recently.

Society News.—Dr. Aubrey Edgar Boling, Jr., presented an illustrated lecture before the Fulton County Medical Society, February 5, on "Cesarean Section Under Local and Spinal Anesthesia," and Drs. Roger W. Dickson and David H. Poer gave a clinical talk on "The Closed Method of Treatment of Acute Empyema." Dr. William C. Waters, Jr., spoke on "Auricular Fibrillation—Cases Treated with Quinidine Sulphate" before the society, February 19, and Dr. Edgar Fincher, Jr., on "Indications for Laminectomy in Spinal Injuries.——The annual meeting of the Georgia Public Health Association was held, January 15-16. Drs. Louis L. Williams of the U. S. Public Health Service, and Thomas F. Abercrombie, state health commissioner, spoke on malaria prevention and on proposed state and national legislation, respectively.

INDIANA

Bills Introduced.—H. 408 proposes to regulate the practice of barbering. H. 361 proposes to regulate the practice of cosmetology.

IOWA

Bill Introduced.—H. 259 proposes to authorize the issuance without examination of licenses to practice dentistry to holders of certificates of the National Board of Dental Examiners.

KANSAS

Bill Introduced.—H. 524 proposes to authorize the boards of education in certain cities and the governing boards of rural high schools, community high schools and district schools to employ one or more nurses.

KENTUCKY

Sentenced for Narcotic Violation.—Dr. Thomas B. Helm, Paducah, who was indicted in the United States District Court, Louisville, for violation of the Harrison Narcotic Act, Nov. 17, 1930, pleaded guilty and was sentenced, Nov. 18, 1930, to serve one year and one day in the United States Penitentiary at Atlanta.

Personal.—Dr. J. W. Davis was elected, January 16, to serve as health officer of Fayette County to fill the remaining two years of the unexpired term of Dr. Rollin E. May, who resigned, January 1.——Dr. James S. Lock, Barbourville, has resigned as executive secretary of the Kentucky Tuberculosis Association after several years' service.

Society News.—A symposium on the x-rays was presented before the Jefferson County Medical Society, Louisville, January 5. Drs. Sydney E. Johnson, Henry C. Herrmann and Samuel A. Overstreet discussed diagnosis of bone diseases, pulmonary tuberculosis and peptic ulcer, respectively, and Drs. David Y. Keith and Isaac T. Fugate, roentgen therapy in tumors of the chest and diseases of the blood, respectively. Dr. Lawrason Brown, Saranac Lake, N. Y., addressed the society, January 19, on "Diagnosis of Pulmonary Tuberculosis for the General Practitioner." A symposium on heart disease was conducted before the society, February 2, at Louisville; the speakers were Drs. Woodford B. Troutman, Joseph C. Bell, Emmet F. Horine and Siegel C. Frankel.——The Daviess County Medical Society was addressed, Nov. 4, 1930, by Drs. William B. Negley and Allen L. Kincheloe, Owensboro, on "Allergic Reactions in Man" and "Treatment for Bronchial Asthma," respectively.——Dr. John W. Duke, Hindman, was elected president of the Kentucky Valley Public Health Association at a meeting of the society in Hazard, Dec. 19, 1930; among others, Dr. Fred W. Caudill, Hazard, spoke on "Handling of Communicable Disease Carriers as a Public Health Duty."——Dr. Wallace T. Partch, Evansville, Ind., addressed the Christian County Medical Society, Hopkinsville, January 20, on "Differentiation of Angina Pectoris and Myocardial Infarction."——Drs. Franklin Jelsma and Aura J. Miller, both of Louisville, spoke before the Harlan County Medical Society, Harlan, January 24, on "Surgery of the Sympathetic System" and "Pain and Its Relation to Clinical Medicine," respectively.

MAINE

Bills Introduced.—H. 454 proposes to provide that all actions for malpractice against practitioners of the healing art be commenced within two years after the alleged malpractice. H. 510 proposes to permit cities and towns to appropriate money to be expended in the city or town where appropriated, under the direction of the state department of health, for public health nursing. H. 522 proposes to make incurable insanity of at least three years' duration a ground for divorce. H. 549 proposes to regulate the practice of cosmetology. H. 970 proposes to accord liens to physicians, nurses and certain hospitals by rendering services to persons injured in accidents, on any settlements or judgments obtained by the injured persons by reason of such injuries.

MARYLAND

Bills Introduced.—S. 47 proposes to regulate the practice of cosmetology. H. 94 proposes to require applicants for marriage licenses to file certificates from reputable physicians that the applicants are not afflicted with any contagious disease.

Society News.—Dr. Francis D. Coman, New York, who accompanied Comdr. Richard E. Byrd's expedition to the antarctic, gave an address, Dec. 16, 1930, at Johns Hopkins University School of Hygiene and Public Health, Baltimore, on "The Climatology of the Antarctic in Its Relation to Health"; Gilbert F. Otto, Sc.D., and William W. Cort, Ph.D., spoke on "Environmental Studies of Worm Infested Families in Tennessee."——At a joint meeting of the Baltimore City Medical Society with the Gynecological and Obstetrical Society, January 9, speakers were Drs. William Schuman, on "Fractured Pelvis in Obstetrics"; William S. Gardner, "Origin of Ovarian Epithelium," and Howard A. Kelly, use of radium in gynecology.——Dr. Major G. Seelig, St. Louis, addressed the Osler Historical Club, January 13, on "Animal Behavior as a Factor in the Development of Medicine and Surgery."——Speakers at the Baltimore City Medical Society's meeting, January 23, were Drs. Charles C. Habliston, on artificial pneumothorax in the treatment of tuberculosis; Robert T. Miller, Jr., thoracoplasty, and Harvey B. Stone, "What Should Be the Mortality in Appendicitis?" The society was addressed, February 20, by Drs. Charles William Victor Richards on "Dystrophia Adiposogenitalis"; Francis F. Schwentker, "Protection of Infants Against Tuberculosis by Specific Inoculation," and Hugh W. Josephs, "Treatment of Secondary Anemia by Iron and Copper."——Dr. Lewis W. Hackett, International Health Division, Rockefeller Foundation, addressed the Society of Hygiene of Johns Hopkins University, Baltimore, January 7, on "The Evolution of Malaria Control in Italy."——There has been a 56 per cent decrease in the number of cases of communicable disease in Maryland in the last year, it is reported; 14,354 cases were noted in 1930 as compared with 32,639 in 1929.——The Baltimore County Medical Association was addressed, January 21, by Drs. Manuel G. Gichner on "Acquired Serum Sensitivity"; Arthur C. Tiemeyer, "Management of the Occiput Posterior Case," and Frank S. Lynn, "Diagnosis of Appendicitis."——Dr. Harvey B. Stone, Baltimore, addressed the Wicomico County Medical Society, Salisbury, January 5, on "Rectal Diseases from the Standpoint of the General Practitioner."——Roentgenologists of Baltimore held a roentgenologic conference, February 6-7, having as their guests members of the New England Roentgen Ray Society, the New York Roentgen Society, the Philadelphia Roentgen Ray Society and the roentgenologists of Washington, D. C. Among the speakers were Drs. William S. Baer, whose subject was "Treatment of Chronic Osteomyelitis by Maggots"; Richard Dresser, "Hodgkin's Disease of the Bones," and Julius Friedenwald, "Clinical Significance of Roentgenological Findings in Chronic Appendicitis."

MASSACHUSETTS

Bills Introduced.—H. 913 proposes to create a medical research board, which shall distribute information obtained by it. H. 592 proposes to require applicants for registration as nurses to be citizens of the United States.

MICHIGAN

Bills Introduced.—S. 7 proposes a new act for the examination, regulation, licensing and registration of professional nurses and trained attendants. H. 85 proposes to establish a state tuberculosis sanatorium in northern Michigan. H. 65 proposes to provide for the registration and supervision of laboratories making chemical, serologic and/or bacteriologic laboratory tests to aid in the diagnosis and/or control of communicable diseases.

MINNESOTA

Bill Introduced.—H. 522 proposes to provide for the sexual sterilization of certain socially inadequate inmates of state institutions.

Society News.—The annual conference of secretaries of the component societies of the Minnesota State Medical Association was held at St. Paul, February 7. Drs. Edward Starr Judd, President-Elect, American Medical Association, Rochester, and Ludwig L. Sogge, Windom, president, Minnesota State Medical Association, were among the speakers.——Dr. Frank E. Burch, St. Paul, gave an illustrated address before the Minnesota Academy of Medicine, February 11, on "Operative Treatment of Squint by Tucking Method." Dr. George N. Ruhberg, St. Paul, presented a thesis on "Paresis and Malaria."

MISSOURI

Licenses Revoked.—The license of Dr. Eric Anderson, Kansas City, was revoked by the State Board of Health of Missouri, Dec. 6, 1929. He was convicted of manslaughter by abortion, June 29, 1929, and was sentenced in the Jackson County circuit court to two years in the state penitentiary. He appealed to the Missouri Supreme Court, which affirmed the sentence of the circuit court, Dec. 19, 1930. The license to practice medicine in Missouri of Dr. Collis I. Roundy, St. Joseph, was revoked, at a meeting of the State Board of Health of Missouri, January 26, for one year on the charges of unprofessional and dishonorable conduct.

Bills Introduced.—S. 224 proposes to provide for the vaccination of dogs against rabies. H. 368 proposes to prohibit

the exclusion of children from school or the discharge of employees from service because they have not been vaccinated and are not otherwise immune to smallpox. H. 426 proposes to establish a hospital for the inmates of Missouri prisons suffering with tuberculosis and other lingering diseases. H. 403, to amend the workmen's compensation act, proposes, among other things, (1) that an employer furnish an injured employee with necessary medical and hospital care for the first ninety days after the injury and in a sum not to exceed $750 and (2) that every hospital or person rendering medical aid to the injured employee shall furnish on request full information to the commission, the employer or the employee.

New Research Institute and Hospital.—The $1,500,000, fourteen story building for the McMillan Hospital and Oscar Johnson Institute of Washington University, St. Louis, was opened in January. It was made possible by a bequest of about $1,200,000 to the university from the late Mrs. William McMillan, St. Louis, for an eye, ear, nose and throat hospital, and by a gift of $650,000 from Mrs. Oscar Johnson, her sons and two friends in memory of Mr. Johnson. Other gifts brought the McMillan fund to $1,500,000, thus providing also for an endowment. On the first and ground floors are eye, ear, nose and throat clinics, administration offices, kitchen and service rooms. The second floor has six operating rooms, an auditorium seating 120 persons, a conference room and locker rooms for visiting physicians, nurses and medical social workers. The next five stories provide 150 beds, two floors being for private and semiprivate patients of the full time and visiting staffs. One floor is for Negro patients, one for white ward patients and one for the care and study of infectious diseases of the eye, ear, nose and throat. The six upper floors will house the Oscar Johnson Institute for research and teaching ophthalmology and otolaryngology. Full time departments in these subjects are financed by a grant from the General Education Board of the Rockefeller Foundation. One floor is devoted to research in physics and physiology as applied to ophthalmology and otolaryngology. Three other floors planned for research in chemistry and bacteriology will be immediately put to use by a grant of $50,000 a year, for a period of five years, by the Commonwealth Fund for a comprehensive investigation of trachoma. A roof garden furnishes recreational facilities for the staff, and a sun parlor for the patients. The following appointments, among others, are listed: C. C. Bunch, Ph.D., as professor of applied physics, department of otolaryngology; William F. Wenner, Ph.D., instructor in otolaryngology; George Holman Bishop, Ph.D., professor of applied physiology, department of ophthalmology; Dr. Percy Wells Cobb, associate professor of applied physics (ophthalmic staff); Dr. Harvey D. Lamb, assistant professor of ophthalmic pathology; Dr. Lee Wallace Dean, head of the department of otolaryngology; Louis A. Julianelle, Ph.D., associate professor of applied bacteriology and immunology, department of ophthalmology; R. Wendell Harrison, M.S., instructor in applied bacteriology and immunology; James A. Hawkins, Sc.D., associate professor of applied biochemistry in ophthalmology, and Alfred M. Lucas, assistant professor of cytology in otolaryngology. Rossleene A. Hetler, Ph.D., will have charge of the chemical studies of vitamin and food deficiencies and of the allergies in relation to eye diseases. Dr. Harvey J. Howard will direct research in ophthalmology, and Dr. Lee Wallace Dean, research in otolaryngology.

MONTANA

Bills Introduced.—H. 285 proposes to require the annual registration of practitioners of medicine or surgery, and the payment of an annual fee of $5 by each of them. S. 68 proposes to make it the duty of all practitioners of the healing art who know or suspect that persons treated or examined are suffering from any communicable disease, or any disease designated as notifiable in the regulations of the state board of health, to report such cases in writing to the county or local health officer having jurisdiction over the area in which such cases are located. H. 102 proposes to accord liens to physicians, nurses or hospitals treating persons injured through the fault of another, on any compromise, settlement or judgment obtained by the injured persons by reason of the injuries.

NEBRASKA

Bill Introduced.—S. 183 proposes that no person, other than licensed practitioners of medicine, surgery, osteopathy, chiropractic, dentistry, optometry or chiropody, or persons operating under their general supervision as assistants, shall in any manner whatsoever use, in connection with the human body, the roentgen ray machine in such a manner that roentgen rays shall penetrate any portion of a human body.

NEW JERSEY

Bills Introduced.—S. 155 proposes to authorize the medical examining board to examine in anatomy, physiology, hygiene, diagnosis of disease, histology, neurology, philosophy of naturopathy and practice of naturopathy persons who on March 31, 1921, were graduates of legally incorporated schools recognized by the board and teaching naturopathy, and who at that time were residents of New Jersey. If such persons receive a general average of 70 per cent or better the board must issue to them limited licenses to practice naturopathy. S. 161 proposes to amend the law allowing charitable hospitals liens, by according such liens to all hospitals. A. 192 makes insanity for fifteen years a ground for divorce. S. 202 proposes to make it unlawful for any manufacturer, wholesale dealer or retail dealer, engaged in the sale or distribution for resale of drugs, medicines or poisons, to sell for resale such drugs, medicines or poisons to any retail merchant who is not permitted by law to sell them. S. 221 requires the annual registration of pharmacists.

NEW MEXICO

Bills Introduced.—S. 72 and H. 181 propose to require that applicants for licenses to practice any form of the healing art pass examinations in anatomy, physiology, chemistry, bacteriology and pathology, to be given by a board of basic science examiners, before presenting themselves to their professional or cult boards for examination. H. 123 proposes to create the office of inspector for the state boards of pharmacy, medical examiners and dental examiners, to aid those boards in the enforcement of the medical, pharmacy and dental practice acts.

NEW YORK

Report on Lead Poisoning.—The Bureau of Industrial Hygiene of the New York State Department of Labor has begun a series of investigations of industrial diseases in order to accumulate information for the conservation of the health of workers and the administration of compensation laws. Lead poisoning, which ranks first in industrial diseases, is the subject of the first report. Of 381 workers studied in twenty-five plants of fifteen industries, 232, or 80.8 per cent, gave definite evidence of lead absorption. The highest incidence, 100 per cent, was found among lead burners, who are exposed to fumes of lead oxide. Workers between 16 and 18 years of age were found most susceptible, the incidence being 87.5 per cent. Duration of exposure appeared to be of little importance, as 19 out of 28 workers who had been exposed for less than two months showed active lead absorption. The report presents in detail the results of the physical examinations and discusses symptoms, treatment and prophylaxis and relation to compensation. The bureau proposes that the term "lead absorption" be adopted to cover cases in which there is laboratory or other positive evidence that lead has been absorbed into the body, whether or not there are clinical manifestations of disease. The term "lead poisoning" should be reserved, the investigators believe, for cases in which toxic episodes such as lead colic, lead palsy and encephalopathy occur.

Bills Introduced.—S. 739 and A. 1029 propose to make it a misdemeanor for any person "to sell for purposes of resale

any United States Pharmacopeia or National Formulary preparation to any person, firm or corporation not registered with the board." S. 740 proposes to require all packages containing barbituric acid to be so labeled. A. 785, to amend the workmen's compensation act, proposes to designate as compensable occupational diseases, "any and all disabling diseases and disabling illnesses" contracted in "any and all employments." S. 594 proposes to provide for threefold damages for injuries caused by the unlawful furnishing, supplying or administering of dangerous drugs or medicines. A. 980 and S. 447 to amend the workmen's compensation act, propose to make compensable any occupational disease or illness that is directly due or caused by any employment coming within the provisions of the act. A. 911, to amend the workmen's compensation act, provides compensation for disability or death which is not wholly due to or results from accidental injury arising out of and in the course of an employment. A. 817 proposes that no hospital supported wholly or in part at public expense shall hereafter charge any fee or other compensation for medical services rendered while operating a clinic to which the public is invited, and that every such service rendered shall be without charge to the patient. A. 786, to amend the workmen's compensation act, proposes in effect to allow injured employees to select their own physicians. A. 656 proposes to provide that all cosmetics be labeled to show that they are not injurious, the name of the compounder and the date of compounding, and to require manufacturers of cosmetics to file their formulas with the state public health department. A. 636 proposes to regulate the practice of chiropractic, defined as "diagnosis, the palpating and adjusting by hand of the vertebral column and tissues. This shall not include the use of operative surgery or obstetrics or the administering or prescribing of drugs or medicine included in the pharmacopeia or materia medica."

New York City

One Thousand Five Hundred Welfare Societies.—The 1931 issue of the Directory of Social Agencies, published by the Charity Organization Society in cooperation with the Welfare Council of New York City and twenty-four other organizations, lists approximately 1,500 organizations caring for the health, education, recreation, general welfare and relief needs of the city. Of this number, 518 are engaged in family welfare work, 557 in child welfare work, 651 in education, recreation or neighborhood activities and 655 in health work. There are in addition about 1,400 clinics, most of which provide free or nearly free health and medical services. More than 250 of the agencies listed are the headquarters of national or international welfare organizations.

Friday Afternoon Lectures.—The spring series of Friday afternoon lectures given by the Medical Society of the County of Kings began, February 27, with Dr. Charles H. Smith, Manhattan, speaking on "Infant Feeding for the General Practitioner." Dr. Charles G. Heyd will present an illustrated address, March 6, on "The Liver and Gallbladder in Abdominal Infection"; March 13, Dr. Elliott P. Joslin, "Rôle of the Practitioner in Preventing Diabetes and Diabetic Mortality"; March 20, Dr. Joseph F. McCarthy, Manhattan, "Roentgenographic Delineation of the Urogenital Tract"; March 27, Dr. Walter L. Niles, Manhattan, "Effects of Digitalis Therapy in Pneumonia"; April 10, Dr. Paul A. O'Leary, Rochester, Minn., "Treatment of Syphilis"; April 17, Dr. Binford Throne, Brooklyn, "The More Common Skin Diseases"; April 24, Dr. Foster Kennedy, Manhattan, "Relationship of the General Practitioner to Neurological Problems"; May 1, Dr. Ralph I. Lloyd, Brooklyn, "The Protruding Eye as a Diagnostic Problem," and, May 8, Dr. Joseph C. Regan, Brooklyn, "Use of Sera in Treatment of Acute Infectious Diseases."

NORTH DAKOTA

Bill Introduced.—S. 214 proposes to make it a misdemeanor for any person to experiment or operate on any living dog or cat for any purpose other than the healing or curing of the animal.

Licenses Revoked and Restored.—At a meeting of the North Dakota State Board of Medical Examiners at Grand Forks, January 8, the license of Dr. Charles I. Spannare, Fargo, to practice medicine and surgery in the state was revoked. Dr. Spannare pleaded guilty in the federal court to a charge of selling narcotics. The license of Dr. William R. Shortridge, Flasher, who was pardoned by the state pardon board after serving five years of a ten year sentence in the state penitentiary at Bismarck for performing a criminal abortion, was restored.

OKLAHOMA

Bills Introduced.—H. 51 proposes to fix a rate which physicians may charge for professional calls. The rate is not stated and is apparently to be decided in the legislative committee in perfecting the bill. H. 145 proposes to allow coroners a fee of $5 for each inquest held and 10 cents per mile for travel while discharging their duties.

OREGON

Bills Introduced.—S. 250 proposes to create a department of osteopathy in the University of Oregon. S. 252 proposes to make it the duty of all hospitals supported in whole or in part by public revenue or exempt from taxation to afford to all practitioners of the healing art the right to practice therein. S. 255 proposes that certificates from licensed physicians, stating that both parties to a proposed marriage are free from communicable diseases, be required before licenses to marry are issued. The present law requires such a certificate only with respect to males. S. 251, to amend the workmen's compensation act, proposes to allow injured employees the right to select their own physicians.

PENNSYLVANIA

Society News.—Dr. Charles H. Marcy addressed the Pittsburgh Pediatric Society, February 13, on "Childhood Type of Tuberculosis," and Dr. Louis M. Kochin presented a case of epituberculosis.——"Pulpless Teeth as Foci of Infection" was the topic of discussion at a joint meeting of the Allegheny County Medical Society and the Odontological Society of Western Pennsylvania, February 17, in Pittsburgh; the speakers were E. A. Wolf, Ph.D.; L. E. Van Kirk, D.D.S.; W. F. Swanson, D.D.S; Dr. Norman C. Ochsenhirt and Dr. Joseph H. Barach.

Philadelphia

Personal.—Dr. Eugene Leroy Mercer has been appointed dean of the department of physical education of the University of Pennsylvania.——Dr. William C. Ryan recently celebrated his twenty-third anniversary in the bureau of police, where he is assistant chief surgeon.

Society News.—Dr. John R. Caulk, St. Louis, delivered the annual B. A. Thomas Memorial Lecture before the Philadelphia Urological Society, February 23, on "Instrumental Treatment of Prostatism."——Dr. Elliott P. Joslin, Boston, addressed the Philadelphia County Medical Society, February 25, on "Diabetes Mellitus: Diagnosis, Prognosis and Treatment."——Dr. Frank C. Hammond, among others, addressed the Obstetrical Society of Philadelphia, February 5, on "Abdominal Operations During Pregnancy."

SOUTH DAKOTA

Bills Introduced.—S. 63 proposes to provide for a statewide census of the feebleminded and for filing a list of the names obtained thereby with all marriage license issuing agencies. No marriage license may issue if one or both of the parties appear on the foregoing list. H. 160, to amend the workmen's compensation act, provides that an injured employee, to be entitled to compensation for hernia, must prove (1) that the hernia did not exist prior to the date of the accident and (2) that it was immediately preceded by an accident arising out of and in the course of the employment. If an employee refuses to submit to an operation he shall not be entitled to compensation.

TEXAS

Bills Introduced.—S. 182 proposes to accord hospitals treating persons injured by accident a lien on any settlements, compromises or judgments obtained by the injured persons by reason of such injuries. S. 247 proposes to create an institution for crippled Negro children and to charge the state board of control with its location, construction, establishment and maintenance. H. 272 proposes to regulate the practice of dental hygiene and to provide for the examination and licensing of such practitioner by the board of dental examiners. The licenses to be issued are to authorize such practitioners "to remove calcareous deposits, accretions and stains from the exposed surface of teeth and just beneath the free margin of the gum, and to prescribe and apply any ordinary wash or washes of a soothing character, but not to perform any operation on the teeth or other tissues of the oral cavity." H. 309 proposes to authorize the establishment of a new state hospital for the care of the insane, to be known as the West Texas State Hospital. H. 400 proposes to authorize the construction

and maintenance of a hospital as a part of the prison system of the state, for the treatment and incarceration of all criminal insane. S. 171 proposes a new law regulating the production, sale, dispensing and other traffic in narcotic drugs.

UTAH

Bills Introduced.—S. 48 proposes to accord liens to hospitals treating persons injured in accidents, on any judgments, settlements or compromises obtained by the injured persons by reason of such injuries. H. 100 provides that accredited training schools for nurses shall allow no student to matriculate who has not had the equivalent of a high school education.

VERMONT

Bill Introduced.—S. 23 proposes to provide for the sexual sterilization of certain socially inadequate persons.

VIRGINIA

Health at Richmond.—Telegraphic reports to the U. S. Department of Commerce from eighty-one cities with a total population of 36 million, for the week ended February 7, indicate that the highest mortality rate (24) appears for Richmond, and the rate for the group of cities as a whole, 14.3. The mortality rate for Richmond for the corresponding period last year was 17.1, and for the group of cities, 13.7. The annual rate for eighty-one cities for the six weeks of 1931 was 14.2 as against a rate of 13.2 for the corresponding weeks of 1930. Caution should be used in the interpretation of these figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

WASHINGTON

Bills Introduced.—S. 96, to amend the workmen's compensation act, proposes to define "injury," as used in the act, to mean an injury resulting from some fortuitous event and to all other injuries, including occupational diseases, growing out of and incidental to the employment. S. 55 proposes to authorize certain school districts to maintain and operate dental clinics. H. 239 proposes to permit dentists and dental students to obtain and possess human dead bodies for the purpose of anatomic inquiry or instruction. H. 169 proposes that hereafter a person convicted of a capital offense shall not be entitled to any inquisition or trial to determine his sanity. On satisfactory evidence being presented to the governor, however, that any person convicted of a capital offense has become insane subsequent to the conviction, the governor may cause such person to be examined by such experts as he, the governor, may choose.

WEST VIRGINIA

Bills Introduced.—H. 165, to amend the workmen's compensation act, proposes to make employers liable for such sums for medical, surgical, dental and hospital treatment accorded an injured employee as may be reasonably required, not, however, to exceed $800. S. 105 proposes to prohibit the sale and distribution of veronal, barbital, or any preparation or compound containing diethylmalonyl urea or diethylbarbituric acid, except on the written prescription of a physician. H. 218 proposes to authorize the public health council to issue certificates to practice medicine and surgery to all persons who apply before Jan. 1, 1932, who have had two years' study in a recognized medical school and who at the time of said study have had twenty years' experience practicing medicine and surgery in the state.

WISCONSIN

Bill Introduced.—S. 71 makes it unlawful to sell any food, drink, medicine or toilet preparation intended for human use, or any antifreeze agent for motor vehicle radiators which contains wood alcohol, methanol or methyl alcohol. Sales may be made only in containers labeled "poison."

WYOMING

Bills Introduced.—S. 5 proposes, among other things, to amend the medical practice act by stating the procedure to be followed by a licentiate in appealing to the court from a decision of the board of medical examiners revoking his license to practice. S. 49 proposes a new pharmacy practice act. H. 187 proposes to make it unlawful for the board of trustees or the governing board of any hospital, supported in whole or in part by public revenue, to refuse to allow any licensed practitioner of the healing art to practice in said hospital.

GENERAL

Society News.—The seventeenth annual observance of National Negro Health Week will be conducted, April 5-12. The objective for this year's observance is the establishment of National Negro Health Week on a year-round basis. It is requested that the results of the health week be sent to the National Negro Health Week Committee, Howard University, Washington, D. C.

International Hospital Congress.—The second International Hospital Congress will be held in Vienna in the early part of June. A preconvention tour of study and inspection of hospitals in London, Copenhagen, Berlin, Prague and Budapest is planned for the American contingent. It is expected that an international hospital association will be formed during the congress. Details may be obtained from E. H. L. Corwin, Ph.D., secretary general, 2 East One Hundred and Third Street, New York.

Translation of Incomplete Credentials.—Frequent requests for translation of American certificates covering only high school and one year college work have been reported to state boards of medical examiners recently. It is said that students who submitted these incomplete credentials have been directly admitted to foreign medical schools, probably because of a misapprehension on the part of foreign university authorities of the nature of American schools. The practice is believed to be a definite attempt to shorten the required American college course.

Report of Ella Sachs Plotz Foundation.—According to the seventh annual report of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, seventy-eight applications for grants were received during the last year, sixty-two of which came from twelve different countries in Europe and Asia, and sixteen from the United States. Twenty-five grants were made, one of these being a continued annual grant. Twenty-one new grants were made to scientists in countries outside the United States. In the seven years of its existence, the foundation has made 120 grants to investigators in various countries. In accordance with the policy of giving preference to researches on a single problem, four investigations aided in 1930 bore on the general subject of nephritis; in 1929 there were seven, in 1928 three and in each of the four preceding years four grants for work in this field. Applications for grants for the year 1930-1931 should be in the hands of the executive committee before May 1 and should include statements as to the character of the proposed research, the amount of money requested and the objects for which the money is to be expended. Applications should be sent to Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695 Huntington Avenue, Boston.

Medical Aid in Drought Area.—Plans for medical relief in the states that have been most severely affected by the drought were formulated at a conference of health officers called by Dr. Hugh S. Cumming, surgeon general of the U. S. Public Health Service, at Memphis, Tenn., February 10. The problem is to be approached from five different angles, according to the local situation. Under the federal appropriation of $2,000,000, existing county or local health units are to be aided by the assumption of obligations when local funds are lacking on account of inability to collect taxes, bank failures or other justifiable causes, and by the employment of additional personnel to meet emergency needs as a temporary measure only. County health units will be established in counties which have no organization on the following conditions: that at least one third of the expense be borne by the local authorities, that one third be borne by the state, or that at least one half of the expense be borne by the state and local authorities together. Mobile health units to provide temporary health services will be furnished as part of the state health administration to be supported by state funds to the greatest extent possible. Individual county nurses and sanitary inspectors are to be provided for counties in which they are needed and in which organized health departments cannot at present be maintained. Finally, state boards of health are to be supplemented by supervisory personnel if needed for emergency work.

Medical Bills in Congress.—H. R. 17039, introduced by Representative Leavitt, Montana, proposes to construct and equip a hospital on the Blackfeet Indian Reservation, Montana. The House Committee on Rules has voted a special rule for the consideration of S. 255, the Jones maternity, infancy and rural hygiene bill, which will bring the bill before the House for consideration probably during the week ending February 28 (H. Res. 369). S. 5465 has been reported to the House without

amendment, enabling institutions incorporated under the laws of the District of Columbia and conferring any and every kind of degree, whose activities are carried on exclusively in a foreign country, to use in their titles the words "American," "Federal," "United States," etc. (H. Rept. 2751). S. 5959 has passed the Senate, authorizing the Secretary of the Treasury to purchase the laboratory of the state of Montana, constructed for the prevention, eradication and cure of spotted fever. A similar bill in the House, H. R. 16915, has been favorably reported to the House, with amendments (H. Rept. 2798). S. 5984 has been favorably reported to the House, without amendment, providing for the erection, for the District of Columbia, of a sanatorium for adult tuberculous persons (H. Rept. 2759). S. 6171 has passed the Senate, regulating the prescribing and use of waters on the Hot Springs Reservation, at Hot Springs, Ark. A similar bill in the House, H. R. 14275, has been reported to the House, with amendment (H. Rept. 2677). S. 1812 has been reported to the House, without amendment, authorizing the annual collection of statistics relating to crime and to the defective, dependent and delinquent classes (H. Rept. 2757). H. J. Res. 480 has been reported to the House, without amendment, authorizing an appropriation to defray the expenses of participation by the United States in the conference on the limitation of the manufacture of narcotic drugs, to be held at Geneva, May 27, 1931 (H. Rept. 2688). H. R. 4811 has been reported to the House without amendment, authorizing the Bureau of Mines to manufacture 1 gram of radium (H. Rept. 2802). H. R. 16658 has passed the House, authorizing an appropriation of $2,850,000 for additional hospital and domiciliary facilities at the branches of the Bureau of National Homes. H. R. 16982 has passed the House, authorizing an appropriation of $12,500,000 for additional hospital, domiciliary and outpatient facilities for veterans. This bill has been favorably reported to the Senate, with amendments which, among other things, propose to increase the appropriation authorized by the bill to $20,877,000 (S. Rept. 1665). S. 6147, introduced by Senator Hatfield, West Virginia, proposes to authorize the construction of a veterans' hospital in northern West Virginia. S. 6178, introduced by Senator Bingham, Connecticut, and H. R. 17140, introduced by Representative Goss, Connecticut, propose to regulate the use and sale of wood alcohol. H. J. Res. 505, introduced by Representative Celler, New York, proposes to remove the frequency and quantity limitations imposed on physicians with respect to the prescribing of vinous and spirituous liquors. H. R. 17094, introduced by Representative Leavitt, Montana, proposes to construct and equip a hospital on the Rocky Boy Indian Reservation in the state of Montana.

Deaths in Other Countries

Emil Fronz, author of books on children's diseases, Dec. 31, 1930, aged 70.——**Archibald Leitch,** director of the research institute of the London Cancer Hospital and professor of experimental pathology, University of London, January 28, aged 52.

Government Services

Resignations from the Navy

The following resignations from the navy have recently been announced: Lieut. Jasper S. Hunt, effective January 3; Lieut. Paul H. Milton, effective Dec. 28, 1930; Lieut. William C. McBride, effective Nov. 28, 1930; Lieut. Comdr. William A. Stoops, effective February 1; Lieut. Connie H. King, effective Dec. 13, 1930; Lieut. Roland G. Vaughan, effective January 6; Lieut. Harold Simons, effective March 22.

Change of Station in the Navy

Lieut. Comdr. Rex H. White to duty involving flying, commander carrier division 1, U. S. Fleet; Lieut. Bartholomew W. Hogan to the naval hospital, Washington, D. C.; Lieut. Julian Love from the Receiving Ship to the naval hospital, New York; Capt. Holton C. Curl detached as assistant chief of bureau of medicine and supplies and ordered to duty as district medical officer, fourth naval district, Philadelphia; Lieut. Comdr. William D. Davis to marine barracks, Quantico, Va.; Lieut. Wilbur F. Kellum from the U. S. S. *Maryland* to the U. S. Naval Medical School, Washington, D. C.; Lieut. Farra L. Read from the Asiatic Squadron to the United States; Lieut. John D. Foley from the naval hospital, New York, to the U. S. Receiving Ship, San Francisco; Capt. John B. Dennis to the bureau of medicine and surgery as assistant to the chief of the bureau; Capt. Richmond C. Holcomb to command the naval hospital, League Island, Philadelphia; Lieut. Edward E. Evans from the U. S. S. *Pittsburgh* to the fourth regiment, U. S. Marines, China; Lieut. Comdr. Walter A. Fort from the naval hospital, New York, to the Asiatic Station; Lieut. Winfred P. Dana from the naval air station, Hampton Roads, Va., to the first brigade, U. S. Marines, Haiti; Capt. Edgar L. Woods from the Receiving Ship, New York, to the Bureau of Medicine and Surgery; Lieut. Harold I. Brown from the naval training station, San Diego, Calif., to the U. S. S. *Henderson.*

Examination for Entrance Into Public Health Service

Examination of candidates for commission as assistant surgeon in the regular corps of the U. S. Public Health Service will be held at Washington, D. C., March 9. Candidates must be 23 years and not over 32 years of age. They must have been graduated in medicine at a reputable medical college and have had one year's hospital experience or two years' professional practice. They must satisfactorily pass oral, written and clinical tests before a board of medical officers, and undergo a thorough physical examination. Surgical candidates will be recommended for appointment by the President, with the advice and consent of the Senate. Request for information or permission to take this examination should be addressed to the surgeon general, U. S. Public Health Service, Washington, D. C.

Report of Food and Drug Administration

The report of the Food and Drug Administration, U. S. Department of Agriculture, for the year ended June 30, 1930, shows that 1,105 seizures and prosecutions of domestic products were made and that 3,433 import samples were detained. In the course of the operations, 36,068 samples of food and drugs were collected and examined. Of these, 3,347 were examined for arsenic, a precaution necessary because of its use as a spray for fruit trees. Sixteen outbreaks of alleged food poisoning were investigated and pathogenic bacteria were identified in five. Work conducted by the administration in the control of traffic in fresh, dried and canned fruit infested with worms centered to a large extent on figs, 625 lots (20,725,310 pounds) of which were examined; of this quantity 2,853,840 pounds were reexported and 870,000 pounds destroyed. Improvement has been made in the quality of canned salmon, only three prosecutions having been made. In the tuna fish industry, however, investigators found conditions similar to those that had existed in the salmon industry. In cooperation with the California state board of health a vigorous campaign was carried on in which twenty-four seizures were made, and the system of state inspection was extended to insure better local control. More than 5,000 cases of canned tomatoes adulterated with water were seized. Thirty-five carloads of frost-damaged grapefruit and oranges were condemned before they were shipped from the citrus belt of Texas. Under the federal tea act, 207,884 pounds of tea were rejected, of 84,732,677 pounds offered for importation during the year. During the year 5,748 samples of milk were examined under the federal import milk act, which applies principally to milk from Canada. An excessive bacterial count was found in 369 samples; 584 plants and 4,127 dairy farms were inspected; 108 permits were suspended. Two hundred and forty-nine seizures of falsely and fraudulently labeled proprietary medicines were effected; it was claimed that 135 of these were remedies for influenza. Ninety-seven court actions involving adulterated or misbranded pharmaceutic preparations were brought during the year. Thirty-nine consignments of ether that failed to meet pharmacopeial standards were removed from the market. The administration cooperated with the Bureau of Prohibition and state health officials in the seizure of twenty-two lots of a product sold as jamaica ginger. In the field of research the administration reports the development of a biologic test for ergot, methods for determining the presence of tartaric and citric acids and work on similar problems. Assistance was given to the Post Office Department in the handling of 130 cases in the effort to eliminate from the mails such contraband materials as fake medicines, cure-alls and poisons. Thirty-six cases were disposed of as follows: fraud orders issued in 12; penitentiary sentences imposed in 2; grand jury indictments issued in 3; prosecutions abandoned because of insufficient evidence in 2; seventeen concerns discontinued business. The name of the organization was changed, July 1, 1930, to the Food and Drug Administration.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 31, 1931.

The Sun Treatment of Tuberculosis in England

When the sun treatment of surgical tuberculosis was established, mainly by work of Auguste Rollier at Leysin, Switzerland, the idea prevailed that the more sunny climates of the continent and the high altitudes of the Swiss mountains were, if not necessary, a great advantage. But the sun treatment of tuberculosis has been so developed in England by Sir Henry Gauvain at the Treloar Cripples' Hospital and College, Alton (Hampshire) and at its marine branch (Sandy Point, Hayling Island) that equally good results are now claimed. Indeed, in his recent residential address to the congress of the Royal Institute of Public Health, Sir Henry Gauvain declared that, in spite of its high proportion of cloudy and misty days, the English climate had the advantage. If sun treatment is of such value in the prevention and treatment of disease, why not send the patient, people asked, to the most sunny climate possible? To this Sir Henry replied by another question: Is mortality appreciably lower in countries regarded as ideal for insolation? Is tuberculosis appreciably less? The reply is in the negative. On equatorial islands where sunlight is always obtainable and the islander can live nude all the year round, tuberculosis will rapidly infect and kill the unimmunized native. The results of the sun treatment are in some cases brilliant, in others disappointing. This Sir Henry explains by his "theory of varying stimuli and varying response." No completely satisfactory explanation has been given of the value of the general light bath. Sonne's statement that it largely depends on thermal effect is not adequate, nor does the raising of hemobactericidal power furnish the clue. Sir Henry Gauvain suggests that the good effects depend on the stimulus of seasonal and even hourly variation in the conditions of exposure—the position of the sun in the heavens, the density and purity of the atmosphere, the amount of sky shine and the intervention of passing clouds. The morning light, though less intense than that of midday, has the greatest value because of the light shock following the darkness that has preceded. Continuous exposure to sunlight in summer is not so beneficial as alternations of light and shade and of heat and cold. Sun treatment is greatly aided by the associated aerotherapy—the stimulus to the production of heat by the body produced by the impact of cold air. Therefore the English climate by its very changeableness lends itself to open-air treatment. Sun treatment is shock treatment, comparable to protein shock.

The report, just issued, of the Treloar Cripples' Hospital shows remarkable successes. Children up to the age of 12 suffering from tuberculous disease of bones or joints and a limited number of general orthopedic cases are admitted. Crippled lads from 14 to 18 are trained in handicrafts. Of 176 patients who had completed their treatment in the year, 170 were sent out with the disease arrested. These included 34 cases of spinal disease, 47 of 52 hip disease, 21 knee and 68 of 69 other tuberculous lesions arrested. The marine branch offers the stimulus of climatic change and new environment to patients who need the tonic of seaside conditions. It is found that very cachectic and young patients are not benefited to the extent that stronger and older patients are. The stimulus is beyond their power of response. Graduated sea bathing and heliotherapy are given to the bulk of the patients in addition to the ordinary orthopedic and general treatment. Conservatism in the treatment of surgical tuberculosis has been followed ever since the establishment of the hospital twenty-one years ago and is now more firmly established than ever. But the help of surgery is occasionally sought for bone grafting to immobilize joints more completely, though in children with only a modified success. Sir Harold Gillies and Mr. Kilner have done some highly successful and extensive plastic operations for facial restoration following lupus after the disease has been cured by the light department.

A New Study of Diet

Almost all the data as to normal diets are those of foreign investigators. The medical research council decided that a more accurate quantitative knowledge of the normal diets of the inhabitants of this country was desirable, for guidance both in health and in disease. It therefore commissioned Dr. E. P. Cathcart, professor of physiology in the University of Glasgow, and Dr. A. M. T. Murray to undertake a study of nutrition. This study took the form of an inquiry into the diet of 154 families of St. Andrews, Scotland, based on the help given and the records kept by the staff of the James Mackenzie Institute for Clinical Research. It may be remembered that this institution was founded by the late Sir James Mackenzie to undertake clinical research into the early stages of disease, a subject which he held to be important and neglected. The families studied belonged to all classes of the population. One of the main conclusions reached was that for the persons examined the consumption of protein was much below, that of carbohydrate below, but that of fat much above, the standards laid down by the accepted authorities. The consumption also deviated in the same directions from the standards recommended by the Royal Society during the war, which were adopted as the basis of the measures taken by the government during the late emergencies of that struggle. The accompanying table shows the results of the present study as compared with the standard diets of Voit and Rubner.

Percentage of Total Calories

	Protein	Fat	Carbohydrate
Voit (moderate work)	16	17	67
Rubner (moderate work)	17	16	67
Present study	11	35	54

Thus the percentage of calories supplied by fat in the population studied was more than twice as great as in the standard diets and even among the poor the percentage was found to be much higher than had been supposed. There is no doubt that the St. Andrews diets are in keeping as regards their proportions with the type of dietary common in this country and that they approximate closely to the average for the United States. Another striking point is the relative lowness in protein. The quality as well as the quantity of food consumed was found to be largely a question of income. With rising income the tendency was to purchase foods rich in protein, such as butcher meat, with sometimes a decrease in the amount of starch consumed. Nevertheless there is a tendency when the income increases to spend more on fat. The miners, with their higher wages, consume more fat than the agricultural laborers. During the war the shortage of fat was the great trouble in dietary. In certain parts of Europe it was followed by a sharp increase in the incidence of tuberculosis, and when the supply of fats became normal again the incidence of tuberculosis immediately declined.

As regards the total energy value there was no evidence of lavish consumption on the part of those better off, though naturally their intake was higher than that of others. A problem which puzzled the investigators was that, while 3,100 calories a day satisfied the manual laborer, the sedentary group consumed more than 3,300. Where did the extra calories go? It was agreed that the sedentary class expended much energy in walking and playing games, but it was doubtful whether they expended anything like the amount of energy represented by the extra food. It followed, therefore, that the extra food

must be stored or metabolized in some other fashion. As obesity was not a marked feature of this section of the population, it must follow that the explanation was luxus consumption or secondary dynamic action.

Action Against Drug Traffickers

The League of Nations Advisory Committee on Traffic in Opium has adopted the following resolutions, submitted by the representatives of Great Britain, Belgium, Italy and Spain. No firm which has knowingly manufactured or supplied for illicit traffic drugs falling under the Geneva convention should be allowed to hold a license to manufacture or trade in these drugs. The committee also recommends that the same rule be applied to narcotics derivative of morphine or cocaine, even though they do not at present fall under the Geneva convention. As there is evidence that illicit traffickers can move freely from country to country in carrying out their operations, the committee recommends that passports and visas be refused to persons so engaged or be canceled if already issued.

PARIS

(From Our Regular Correspondent)

Jan. 21, 1931.

Chemotherapy in Tuberculosis

There is general agreement among tuberculosis specialists that the results of aurotherapy, if not definitive, are at least important in well chosen cases. In support of this treatment, Prof. Léon Bernard presented a paper that favors continuing the trials. The Société des médecins des hôpitaux de Paris, in a recent discussion, enlarged the field and included communications on the use of other chemical substances that may reinforce or replace the use of gold salts. Messieurs Flandin, Lecocq, Maison and Thiroloix gave their opinions based on numerous therapeutic trials made not only with gold salts but also with salts of cerium and molybdenum. After pointing out how difficult it is to interpret the improvement observed in pulmonary tuberculosis, which may appear spontaneously, they said that the best criteria of the therapeutic effect are the temperature, the weight, bacilli in the sputum, and, the radiologic modifications. In using gold salts the authors prefer a fat-soluble compound in the form of intramuscular injections, as it appears to expose the patient less to reactions sometimes observed after intravenous injections. The results in most cases have been satisfactory. As regards cerium, whether it is given by mouth or injected intramuscularly, the authors consider that the results secured were at least equivalent, which makes it possible to alternate with the gold treatment. Molybdenum, on the basis of more recent trials, produced, it seems, better results than other products hitherto employed. It dispels the bacillus from the sputum, while, at the same time, the general condition improves rapidly.

Parathyroid Extract in Arthritis Deformans

At a recent meeting of the physicians of the hôpitaux de Paris, chronic rheumatism was discussed. For several years Léopold Lévi and Henri de Rothschild have called attention to the rôle of the thyroid secretion in arthritis deformans, and they have introduced a form of treatment with powdered thyroid substance, which has often given good results. At present, extracts of parathyroid glands are being tried, although the parathyroid glands are supposed to have an action rather antagonistic to that of the thyroid. Weissenbach, Fraujon, Perlès and Seidmann have announced the results that they have secured over a period of more than a year in a dozen cases of chronic arthritis deformans in which they used parathyroid therapy subcutaneously in successive and repeated series, with a dosage of from 1 to 2 cc. daily. In general, an immediate local and painful reaction follows the injection, which produces marked relief, a quieting of the pain symptoms and a frank functional amelioration, which persists for several hours. The improvement appears to be more stable if a sufficient number of injections have been given. When the treatment is stopped, one often observes recurrences of the articular symptoms. In general, the final results are satisfactory. The joints become supple and the general condition improves. However, one must watch for signs of intolerance. The authors are unable to reach a definite conclusion with regard to the nature of the action of this glandular extract.

The Nature of Beriberi and of Scurvy

At a meeting of the Société de médecine et d'hygiène tropicales, discussion arose as to whether or not beriberi and scurvy are, as it commonly supposed, deficiency diseases. In the opinion of R. Dumas, beriberi is not a deficiency disease but rather a toxi-infection. He reports in support of this theory several cases that he observed in the colonies. In these cases the beriberi was not due to a deficiency, for there was an abundance and variety of foods, but was plainly due to a disease of the rice grain. White rice spoils rapidly, whereas the brown rice, protected by its epicarp, is less frequently contaminated by cryptogams. As for scurvy, there is nothing to prove that it is a deficiency disease. The author, who had occasion to observe numerous cases of scurvy during a long voyage, gave several theories on the subject. Mercel Léger shares the views of Dumas on the pathogenesis of beriberi. He had observed in Tonkin cases that left no doubt as to the toxi-infectious nature of the disease. He had seen contagious cases in Hanoi. Mr. Labernadie stated that in the Indies beriberi occurs in the regions in which the rice is milled by mechanical process. In Indo-China, he never saw a case of contagion in the hospital. It is evident, therefore, that the question is complex and difficult to decide. Mr. Nattan-Larrier, who thinks that beriberi is contagious, referred to the cases of contagion cited by Mr. Jeanselme. On the plantations of Cochin China, where only a day's supply of rice is milled at one time, no cases of beriberi are ever observed. This discussion, which opens up again scientific questions hitherto regarded as settled, is somewhat perplexing, for it leaves unexplained the cases in which beriberi has been reproduced experimentally in animals by a suitable defective diet and has been cured by a return to the normal diet, the same as in rickets.

BUDAPEST

(From Our Regular Correspondent)

Jan. 9, 1931.

International Stomatologic Congress

The Association Stomatologique Internationale will hold its first international congress at Budapest, September 2-7. The last congress, which was held in Venice, was a national Italian congress, but representatives of thirteen nations were present. In place of the resigning chairman, Dr. Chompret, Paris, they elected professor Szabó, Budapest, and instead of Dr. Herpin, Paris, general secretary, they elected Dr. Sturm, Budapest. The congress will take place with the support of the Hungarian government and the city of Budapest. Lectures will be held by invited experts from all parts of the world. There will be also an exhibition of dental and surgical instruments. The office of the congress is in Budapest, IV, Városház ucca 14. The chief secretary is Dr. Morelli, lecturer to the University of Budapest.

Intravenous Resorcinol Treatment in Acute Polyarthritis

At the Budapest St. Stephan Hospital, experiments were made with the intravenous use of resorcinol in cases of acute polyarthritis. They were encouraged by the results achieved with similar administration of resorcinol in septic cases. As reported by Dr. Stephan Roth, junior physician, during the period 1927-1930 out of 258 patients suffering from polyarthritis they

selected 105 patients as suitable for intravenous treatment. The patients were rather young, and their disease was acute, with high fever, violent arthritic pains, tumescence and redness; that is, the attack was primary and not a relapse. In subacute and in chronic cases the intravenous resorcinol treatment is not indicated. The method is not contraindicated in acute cases complicated with endocarditis. Thus, of their 105 cases, 65 presented endocarditis. Resorcinol was given in every case intravenously in a dose of not less than 1 Gm. dissolved in freshly distilled and sterilized water. The injection is accompanied by buzzing of the ears, fainting and accelerated breathing, which last for two or three minutes. Every patient gets, in all, from 5 to 6 Gm. of resorcinol, without any harm whatever. The good effect of resorcinol may be augmented by the simultaneous oral administration of sodium salicylate. Of 105 patients, 56 have been cured, 20 improved and 29 less improved, so that in the cases of the latter category other methods of treatment had to be resorted to. In the most favorable cases the injection is followed by profuse perspiration, and the fever falls by crisis. This is succeeded by a better general feeling and a decrease of pain, and the tumescence and redness of the swollen joint abates from hour to hour. Some of the cases have been under observation more than eighteen months and as yet no relapses have occurred.

Restitution of the Family Physician

In late years, when critical economic conditions prevailed in Hungary, private practitioners complained of the ever increasing number of sickness insurance companies, which admit as members also people who can afford to pay for medical services. As a result the old family physician system, which was a boon to both families and physicians, almost entirely ceased. Physicians in trying to resuscitate this system have appealed to the medical association for the elaboration of new rules that would satisfy physicians and at the same time also the public. The board of directors of the association intends to regulate the family physician system as follows: the position of a family physician commences with the first of January and ends with December 31. If the connection is interrupted after the first of April, the whole year's salary has to be paid by the patient. The minimal price in Budapest is 100 pengo (about $18), while outside Budapest it is 50 pengo (about $9). In the larger towns the branches of the association have to fix the prices of the family physician, paying due attention to the minimum. If the patient moves farther than 2 kilometers from his previous dwelling (in relation to the physician's house), a new agreement should be made. Consultations with other physicians, operations, and night calls have to be paid for extra.

A Disease of Paprika Cutters

Paprika is a special Hungarian condiment, which, when dried, becomes red and in this state it is cut and milled, whereby it becomes a condiment. Dr. F. Kovacs, in a paper read before the Budapest Royal Medical Society, described a disease affecting paprika cutters. He often observed a peculiar disorder of the lungs the symptoms of which resembled those of tuberculosis, while a roentgenogram reveals a picture reminding one of a diffuse broncho-alveolitis. Paprika cutting consists of cutting out the ribs of the vegetable, because this contains mostly capsicum, and thus paprika loses its excessive smartness. It seemed probable that the disease was caused by the rising paprika powder, but this is contradicted by the fact that the paprika millers did not show any such manifestations, although they are grinding the strongest paprika powder. The causative agent is a mold, which the cutting women constantly inhale. The disorder of the bronchi is caused by the fine spores. The disorder may involve the pleura and may cause also severe bronchiectasis. It should not be confused with tuberculosis. It is easily differentiated by microscopic examination of the sputum. The most important question is one of prophylaxis. This is not difficult because the catarrh occurs only if moldy paprika is being worked up; from this, it is obvious that paprika should be worked up in a fresh state. In practice this is well nigh impossible, because this is a small industry, and most of the establishments employ fifteen or twenty women who want to keep working for the whole winter. Thus they have to store the autumn picked paprika, which gets moldy when standing in the storehouse. Dr. Kovacs urged that a law be made requiring the frequent turning of the paprika in the storehouse to prevent its getting moldy.

ITALY

(From Our Regular Correspondent)

Dec. 31, 1930.

Meeting of Anatomical Society

The Società italiana di anatomia held its second national session in Florence, under the chairmanship of Prof. Giulio Chiarugi, director of the institute of anatomy of the University of Florence.

Professor Terni of Padua spoke on the first topic on the program, "The Newer Morphology of the Autonomic Nervous System." The speaker explained the methods that have been developed by morphologic research on the vegetative system, mentioned the physiomorphologic discoveries of Gaskell-Langley and discussed certain subjects pertaining to the development and to the structure of the sympathetic system. He referred to the opinions on the origins of the sympathetic system and concluded that, while an active migration of sympathetoblasts from the neural tube and from the neural crest is not certain, there is evidence of a directive, organizing action of the neuraxon on the development of the autonomic system. The speaker considered then the question as to whether the cells of the autonomic system have a particular appearance that distinguishes them from other central and peripheral nerve cells and discussed the character of the myelinization (or the absence of myelinization) of the nerve fibers as a differential criterion. Finally, Terni discussed the phylogenetic significance of the autonomic system, including the sympathicus and the parasympathicus, and pointed out the difficulty of identifying in the invertebrates a system analogous to the autonomic system of the vertebrates. He recognized, however, for all groups of the latter the existence of a preganglionic and postganglionic sympathetic and parasympathetic system, and considered the autonomic system as genetically, as well as functionally, connected with preganglionic centers.

EXPERIMENTAL RESEARCH ON THE CEREBELLUM

Professor Simonelli of the University of Florence presented a paper on "Morphologic Data as a Guide in Experimental Researches on the Cerebellum." The speaker recalled the newer morphologic division of the cerebellum according to Bolk and others and raised the question as to within what limits one can recognize a distinct and separate function in the various cerebellar formations. The cerebellovestibular relations constitute a point of generic interest. Until recently there was a tendency to hold that in the cerebellum are located the centers of the labyrinthine reflexes, but today, on the basis of recent research of the Magnus "school" and the Florence "school" of physiology, it must be accepted that, while the action of the cerebellum takes place through the operation of these reflexes, their centers are, however, doubtless, located outside the cerebellum itself. As regards the functions of the various lobes of the cerebellum, numerous experiments of demolition and of cortical stimulation have established rather constant facts with reference to the anterior lobe, certain zones of the posterior median lobe, the crus primum and the crus secundum. Also with reference to the other areas, accurate researches are not lacking, but the physiologic data that have been secured do not appear sufficiently controlled by histologic examination and do not present sufficient agreement between the phenomena of suppression and those of stimulation.

In addition to the official papers and the general discussion there were other communications. As a general conclusion, it was emphasized that the greater part of the research carried out thus far in this field is based on too few cases, considering the great importance of statistical studies on this problem. There was a possibility thrown out of carrying on systematic research simultaneously in the various provinces of Italy.

Professor Spadolini, physiologist of the University of Siena, presented a communication, illustrated by the projection of numerous photomicrographs, on the genesis of blood platelets.

Professor Pensa of Pavia spoke on the structure of the cerebellum, taking up the discussion of certain problems of neurologic interest.

Palermo was selected as the meeting place for the next convention, and Professor Luna, director of the Institute of Anatomy of the University of Palermo, was chosen president.

Congress of the International Society of Microbiology

The Italian section of the Società internazionale di microbiologia will hold its third congress in April, in Milan. The following topics will be discussed: (1) Pathogenesis of Diseases of Plants, presented by Professor Montemartini of the University of Palermo; (2) The Newer Knowledge Concerning the Biology of the Tubercle Bacillus, discussed by Professor Puntoni of the University of Rome, and (3) Hypersusceptibility in Disease, with paper by Professor Zironi of the University of Milan. In addition, Professor Pepeu of the Istituto sieroterapico in Milan will present a communication entitled "Modern Views on Antidiphtheritic Vaccination."

The Medicopedagogic Convention

The second National Medicopedagogic Convention was held in Milan under the auspices of the Associazione pro infanzia anormale and the Lega (league) per l'igiene e la profilassi mentale. The purpose of the meeting was to stimulate an exchange of ideas between competent persons interested in scientific and practical problems concerning the treatment and education of children who have mental defects or defects of speech or hearing. On this occasion, a demonstration was given of the organization as completed by the municipality of Milan, in the special institutions for persons with mental defects, which have all the necessary aids for complete and rational medicopedagogic assistance. Professor Medea, in his inaugural address, described the work accomplished during the past decade, by the Child Welfare Society, which culminated in the creation of the special Zaccaria Treves school.

Professor De Sanctis, director of the Clinica neuropsichiatrica of the University of Rome, discussed the measure of success that has been secured in the rendering of medicopedagogic aid in the various forms of mental instability in children. He explained the medical and the pedagogic sides of the problem. As to the medical side, De Sanctis emphasized the great frequency with which the psychic anomalies of children are the effect of organic diseases of the brain of an inflammatory nature and, particularly, of an infectious type, among which congenital syphilis plays an important part. As for the pedagogic side, the speaker considers that the environment, both physical and moral, has a great deal to do with the development of mental disease and should therefore be surveyed and, if necessary, changes made while there is time. The organic constitution before the mental disease developed should be studied as a concomitant cause, and such information is most often furnished by the environment.

A. Veratti referred to the activity developed by the juvenile court of Milan during its first two years. It was only natural that a controversy developed between two opposing scientific schools, one of which approves and the other rejects the collaboration of the psychiatric expert with the magistrate. The Milan tribunal, taking advantage of the discretional powers conferred on it by law, considered the opinion of the medical specialist necessary in every case.

Dr. Albertini and Professor Corberi offered a paper on the present status and the indications of medicopedagogic aid for children affected with mental anomalies. The speakers explained the provisions made for abnormal and for backward children by the law pertaining to maternity and childhood, and consisting of ambulatoriums for diagnostic observations, under the direction of medical specialists; schools in psychopathic hospitals, and independent schools the purpose of which is the adaptation, as far as possible, of mentally abnormal children to life, and to carry out the specific prophylaxis to reduce the delinquency of minors. There are, in addition, differential classes for backward children in the elementary public schools.

Instruction in Occupational Medicine

By a recent circular letter sent to the faculties of medicine in the universities, the minister of public instruction established an official course in medicine pertaining to occupational diseases. The purpose of the instruction will be the training of experts who can then be assigned to the welfare institutes for the hygienic and social protection of workmen. The faculties of medicine, in addition to adding the new branch of study to their program, must advise the students to take the course.

Appointment of Director of Health Department

Dr. Gaetano Basile has been appointed director general of the department of public health. Dr. Basile was a pupil and assistant of Professor Pagliani and, later, provincial physician. His services as hygienist were of great importance during an epidemic of plague that occurred in Naples in 1901, and during the cholera epidemic of 1911 in Messina. Prof. Arcangelo Ilvento was appointed assistant director general of the hygienic and sanitary services of Italy. He is at present director of the sanitary services of the Italian Red Cross Society and a specialist in the field of welfare work, social insurance and social hygiene.

The Medical Press in Italy

The question of the medical press is being discussed at present in Italy. The excessive number of medical reviews, amounting to more than 300, is generally deplored. Some of the journals are merely advertising mediums of pharmaceutic houses; others are in the interest of some form of publicity; still others are personal, being written entirely by a single individual. About a hundred of the journals have real medical importance, and of these about thirty are for the publication of the proceedings of academies or medical societies; ten are reviews of a general character, and about sixty are the organs of the various specialties, with an average of two or three reviews for each of the twenty or more special branches of medicine and surgery. According to some it would be well to limit the number of special reviews to one for each specialty. But the proposal does not appear feasible, for the reason that there are some specialties (phthisiology, oncology) that have a large number of publications and that would not submit to such curtailment. According to others, the selection will be spontaneous, with the elimination, on the part of the public, of the reviews that present a slight interest. Others propose the organization of an association of the medical press, as there is none in Italy at present, urging that such problems could be properly handled by such an association.

Statistics on Cancer

Dr. Corradini of the Clinica medica of Florence has collected statistical data on cancer from the case histories of cancer patients admitted to the clinic during the period 1901-1930. The diagnosis of cancer was made in 340 cases, and the diagnosis was confirmed in each case in which necropsy was possible. As regards sex distribution, 68.3 per cent of the patients were men and only 31.7 per cent were women. This observation is in contrast with the statistics usually given by authors, some of whom report 60 per cent of the cases in women and 40 per cent

in men. But it should be noted that the statistics of Corradini concern an institute of Clinica medica, to which no patients with uterine cancer are admitted, they being received at the gynecologic departments, nor any patients with mammary cancer, who are sent to the surgical departments. As to the age of the patients, the majority are mature and none were under 20. It was observed that 15.4 per cent of the patients were under 40 years of age and 84.6 per cent were above that age. The most common site was the digestive apparatus. Of 340 cases, 218 were cancer of the stomach (64 per cent) and 32 were hepatic neoplasia. Of the 218 cases of cancer of the stomach, 158, or 72.48 per cent, were in males, and 60, or 27.52 per cent, were in females. Of these patients, 84 per cent were above 40 years of age, while 37.5 per cent were under 50, and 62.5 per cent were above 50 years of age.

VIENNA

(From Our Regular Correspondent)

Jan. 6, 1931.

Treatment of Thrombophlebitis with Roentgen Rays

Prof. Dr. T. Halban, head of the gynecologic department of the Wiedener Hospital in Vienna, presented recently, before the Wiener Gesellschaft der Aerzte, a number of patients who had been treated by roentgen rays after his new method, as a cure for thrombophlebitis. Encouraged by the results secured in other inflammatory conditions, Halban employed roentgen rays in all cases of phlebitis occurring in his department, the whole inflamed area being treated at short intervals with weak erythema doses. Phlebitis, a painful disease which sometimes confines patients to bed for months, often changed its character abruptly. The first sign of improvement is freedom from pain, which follows the treatment almost immediately. The temperature becomes normal in from one to two days; the swelling goes down, and the inflammatory process is checked. In a number of the cases presented, a cure was effected in two days. The results secured with roentgen irradiation in the trial cases have been so satisfactory that this procedure has been employed in the department of Halban in all cases of phlebitis, along with other recognized modes of treatment. As the transportation of phlebitis patients to a roentgen laboratory is dangerous, Halban recommends the use of a portable roentgen apparatus in the hospitals, in order that the irradiation may be applied at the bedside.

Radium for the New Cancer Hospital in Vienna

Under the direction of Professor Tandler, who is the head of the Vienna bureau of health, the municipality has decided to spend $300,000 for the purchase of 5 Gm. of radium. With this purchase Vienna will have secured the same amount of this element that Stockholm possesses, and only one other city of Europe (Paris, 6 Gm.) will have more. The purchase has been under consideration for four years, so as to give an opportunity of studying the plan from every angle. Professor Tandler visited the Stockholm "Radium hemmet" and received from Professor Forsell, the director, valuable advice and assistance. Two other physicians of Vienna have studied the Stockholm methods on the ground, and Professor Forsell has permitted one of his assistants to come to Vienna. In order to carry out as soon as possible the treatment of cancer patients with the new supply of radium, the municipal hospital in Lainz, a suburb of Vienna, has vacated a number of rooms for the "Vienna municipal cancer institute" and in April the institute will begin its activities. The institute will be available not only for the patients of Vienna but for anybody. As Professor Tandler stated when, at the last session of the municipal council of Vienna, he made his announcement, the solution of the cancer problem is one of the most urgent needs of medicine. The mortality from neoplasms has reached first place in Vienna and exceeds that of all other causes of death given in the statistics. In a radium institute organized on modern lines, not only early treatment of cancerous conditions, which is so important, can be carried out, but also opportunities are offered for the prompt recognition of such conditions and for the after-treatment following cancer operations. In the present status of cancer therapy, paramount importance is attached to the after-treatment. Immediately after the establishment of the radium institute, it is planned to organize a school in which courses will be given to fit physicians for the work of a radium specialist. There are few genuine radium specialists. Heretofore, radium has been employed chiefly by the surgeons, the gynecologists and the dermatologists. For each case the optimum was left, to a great extent, to chance. Then, the quantity of radium that was available in Vienna was too small to meet the needs. Many, for want of money, were compelled to forego radium treatment. Radium therapy received its first impetus in Vienna. It is well known that the Austrian government, several years ago, presented to Madame Curie the 5 Gm. of radium that is now in Paris—at which time it was not as expensive as at present. Vienna will thus soon have two cancer hospitals, one an American foundation (Child Canning's Cancer Hospital Foundation in Vienna), which has been active for the past year and a half but which does not have much radium, and the new municipal radium institute, which in fact will be chiefly a cancer hospital and secondarily an institute of research and instruction.

Results of Malariotherapy in Dementia Paralytica

In the Vienna psychiatric clinic, where malariotherapy as a form of treatment in dementia paralytica was inaugurated by Wagner-Jauregg, an exact series of statistics on the results of this fever therapy has been preserved and offers excellent material for the study of the problem. From this large series of cases, Dr. Dattner, the first assistant of the clinic, selected 129 cases for careful study. These patients received the malarial treatment during the period 1922-1924, so that from six to eight years has since elapsed. His investigations reveal that 67, or more than 50 per cent of the patients, are still living, while the number of permanent cures is surprising. Of these 67 patients, 53 are perfectly well. The original fears that the malariotherapy only delays the progress of the disease and that it would later break out anew with greater force have proved to be unfounded. One of the first patients to receive malarial treatment has been free from all symptoms for ten years. Similar results have been achieved in many patients treated since that time. The many patients in whom the progress of the disease has been checked and in whom the condition is stationary must be regarded as cured, since the Wassermann test on the spinal fluid has been consistently negative. And even though the malariotherapy exerted no appreciable influence on the clinical picture, it has lengthened the life of the patient. The malariotherapy is most effective in combination with an arsphenamine, in the form of after-treatment. The combined method gives the most permanent cures and the fewest deaths. Of thirty patients who received the combined treatment, seventeeen are alive after eight years, while fifteen have fully recovered; eleven have died, some of them from intercurrent diseases. The results as shown by these statistics exceed the boldest expectations. The large number of permanent cures, without remission over a period of from six to eight years, of a disease hitherto regarded as incurable and fatal, constitutes a triumphant success for malariotherapy. It will be recalled that Professor Wagner-Jauregg, the proponent of this form of treatment, was awarded the Nobel prize in medicine for 1929.

Death of Professor Pregl

The death of Prof. Fritz Pregl, the Nobel prize winner in chemistry for 1923, from the effects of a pleuritis, occurred recently. For years, he was director of the chemical institute

in Graz, after having held a similar position in Innsbruck. Born in 1869, Pregl was the creator of the method of quantitative organic micro-analysis, which makes possible complete analyses with only a few milligrams of material for examination. Pregl's new method, together with the use of the micro-scale, which he constructed in collaboration with the scale manufacturer W. Kuhlmann, soon became the common possession of the scientific world and yielded unexpected good results. Pregl's method proved to be especially valuable for biologic and physiologic research, since heretofore the lack of material made their solution practically impossible. Pregl introduced also a stable solution of iodine (Pregl's solution), which is well known as a disinfecting fluid. With the passing of this eminent scholar, the world loses a scientist whose activities have exerted an enduring influence.

BERLIN

(From Our Regular Correspondent)

Jan. 12, 1931.

Stricter Regulations for Prescribing Opiates

On the basis of section 5 of the opium act of Dec. 10, 1929, the federal ministry of the interior, with the approval of the federal council, issued, under date of Dec. 19, 1930, a decree that establishes more strict regulations pertaining to the prescribing and dispensing of opiates and cocaine. Medicines that contain these substances may be prescribed only by physicians, dentists and veterinarians and then only on medical indications. Medicines that contain more than one narcotic may not be prescribed, nor medicines that contain coca leaves or preparations of coca leaves or an ester of morphine other than heroin. There is also a prohibition against prescribing various narcotics in substance; also against medicines that contain more than 15 per cent of morphine or heroin or the like.

The quantity that may be prescribed for a patient in one day is restricted. If the physician in particular cases wishes to prescribe for a patient in one day medicine that contains more than 2 Gm. of opium or opium preparations or more than 0.2 Gm. of morphine, he must enter notes on the case in a so-called morphine book, including the name, place of residence and age of the patient, and a statement as to what condition necessitates the excessive dose of morphine or opium. He must also state the day on which the prescription is made, the amount of morphine contained in the medicine, and the period for which the medicine is prescribed. Other opiates may not be prescribed at all in these large quantities.

If the medicine is intended for a narcotic addict, the physician must answer in the book a number of special questions. He must enter on the prescription, before his signature, in his handwriting, the words "prescription entered." Also the supply that the physician may secure for his office practice is limited; in other words, he must make the same entries for opium and morphine as have just been mentioned.

Medicines containing cocaine the physician may prescribe for a patient for his own use only in solution, and then only in case the purpose intended cannot be attained in any other way. Here, the quantity of cocaine that can be given at one time may not exceed 0.1 Gm. daily. The physician may use medicines containing cocaine only for interventions on the eyes, the larynx, the nose, the ears, the pharynx and the jaws, and then only in case the cessation of pain cannot be accomplished in any other way (up to 1 Gm. daily). Cocaine is thus prohibited wherever it can be replaced by its substitutes. Also for every prescription of cocaine the proper entries must be made in a special book. Further regulations concern the mode of prescribing; for instance, the prescription may not be dated back or ahead. The regulations pertaining to the drawing up of the prescription are detailed and precise. Prescriptions that are not made out in accordance with the regulations or that call for undue amounts of a narcotic may not be filled by the pharmacist. However, though a prescription of a physician may not be made out correctly in every detail, it may be filled, provided the bearer of the prescription convinces the pharmacist that an imperative need exists that makes necessary the immediate use of the medicine. In such a case, however, no more of the narcotic may be dispensed than the circumstances justify.

Concerning the medicines dispensed, the pharmacist must keep written records, which, together with the prescriptions, must be preserved for at least five years. Part of the decree goes into effect February 1 and part of it April 1.

These regulations are intended to curb the increase in the number of addicts since the war; that is, the illegitimate use of these substances. The previous legislation sought merely to provide a supervision of the traffic in substances covered by the opium law and a control of its operation. Thus, the justification for the opium law states that the addiction to a narcotic is often fostered by supplies that are procured from drug stores on the basis of a physician's prescription. Hence, the physicians, dentists and veterinarians had to be included in the group of persons to whom the opium law was immediately directed.

With these regulations, which interfere extensively with the physician's freedom of treatment, the government has the means of supervising much more successfully the opium law in the interest of the public health service. At the Danzig medical convention the German medical profession took a harmonious attitude in keeping with the purposes of the decree "in order that they might lend their support to combating addiction to narcotics." The profession, through its resolution, has taken up in a vigorous manner the crusade against narcotics.

The Increase of Influenza

Toward the end of the old year, there were not many cases of influenza; now they are increasing daily. At the Berlin Allgemeine Ortskrankenkasse the number of cases reported daily up to Christmas was about fifty. December 29, the number rose to 109; the day following to 254, and on the last day of the year the 300 mark was passed. During the first days of January the incidence remained about the same. Fortunately, the disease still preserves a mild course, though there have been cases with complications, particularly pneumonia, and some have been fatal. Since, at present, the number of patients in the hospitals is comparatively small, there is a reserve supply of beds. The municipal health bureau is making all necessary arrangements so as to be prepared in case of an epidemic of influenza; that is, as far as Berlin, under present economic conditions, is able to provide.

Institute for Research on Heart Disease

The institute for heart research established in Bad Nauheim, through the generous gift of Mrs. Louise G. Kerckhoff of Los Angeles, is nearing completion and can probably be opened the coming spring. The new institute, named after the donor the "Kerckhoff-Institut," will be in charge of Professor Groedel of Bad Neuheim. There will be four departments: a department of examination and diagnosis for patients of the social insurance system; a department for the collection of statistics on the causes of heart disease; a department for public enlightenment as to the causes and the best methods of combating heart disease, and a department for experimental pathology and therapy of heart disease. An administrative council composed of federal representatives, the chairman of the bureau of insurance of Hesse, and representatives of neighboring universities and members of the medical profession will manage the institute.

The Noise in Large Cities

The crusade against the noise of large cities is entering on a new stage after a long period of quiescence (The Journal, Sept. 27, 1930, p. 949). The Verein deutscher Ingenieure is about to organize on a large scale the crusade against the noise evil. Similar to the organization in New York, the work will be divided into sections. The psychologic section will deal

with research on the sources and the varying degrees of intensity of sounds; also on the intensity of tone sensations. A medical section will study the influence of the noise on the nervous system, on the performance of labor and on sleep. A legal section will test the possibility of the law and the police influencing the production of noise, and a technical section will ascertain to what extent the noise of machines and technical apparatus can be reduced and to what extent it is possible to construct machines that are practically noiseless.

Investigations on the effects of noise of various intensities on the hearing can be made with the means at hand, but there is no method available for the measurement of the subjective sensations or for a comparison of the effects of noise on the individual person. How fruitful such investigations may be is revealed by the fact that, with the same physical intensity of sound, the tone may, under certain circumstances, be perceived ten million times more intensely than under different circumstances.

The thorough, scientific manner in which the Verein deutscher Ingenieure is attacking the problem is praiseworthy, yet the question arises whether this thoroughness will unduly delay its practical solution. For the public the sole question is that ways and means may be promptly found to check the persons who produce immoderate noise on the streets, and who are easily recognized; for example, motor cyclists who permit unnecessary gas explosions, the manipulators of auto horns, street car motormen who tear across the switches with a deafening noise, and drivers of trucks loosely loaded with rails. The essential work of prevention can be accomplished without scientific research and without interfering in any way with a more scientific study of the problem. The elimination of loud noises in cities is a crying need.

The Cost of Medical Study in Germany

Der deutsche Hochschulführer, which is published by the students' association, estimates the approximate cost of medical study, including the cost of living, at 8,600 marks ($2,046). This estimate allows from 190 to 220 marks for dues and tuition per semester for the five preclinical semesters and from 280 to 310 marks for the six clinical semesters. For dentistry the total costs are only 5,400 marks ($1,285). The expenditures for the three preclinical and the four clinical semesters are the same as for medicine.

Marriages

EDWIN CROWELL HAMBLEN, University, Va., to Miss Agnes Morton Baptist of Ivy, Dec. 27, 1930.

CHARLES P. M. SHEFFEY, Lynchburg, Va., to Miss Mae Joy Burch of Richmond, Dec. 31, 1930.

DAVIS W. RITTER, Winchester, Va., to Miss Lorraine Manger of Reading, Pa., Nov. 2, 1930.

VINCENZO E. MATURI, Bayonne, N. J., to Miss Sissy Cortese of Naples, Italy, Nov. 15, 1930.

FRANCIS X. KRYNICKI to Miss Halina Regina Raczynski, both of Detroit, January 6.

SAMUEL ROSEN, Savannah, Ga., to Miss Estelle Sawilowsky in Augusta, Dec. 14, 1930.

JOHN CLAIBORNE PALMER, Guinea, Va., to Miss Jane Foster of The Plains, January 3.

DAMON A. BROWN, Madison, Wis., to Miss Joyce Ball of Stevens Point, January 3.

JULIAN P. PRICE to Miss Clara Haynsworth, both of Florence, S. C., February 7.

JOHN B. OVERALL to Miss Elizabeth Waters, both of Springfield, Ky., Dec. 31, 1930.

HAROLD B. FENECH to Miss Eleanor O'Brien, both of Detroit, January 18.

Deaths

Joseph Phineas Runyan ⊕ Little Rock, Ark.; Medical Department of the Tulane University of Louisiana, New Orleans, 1890; professor of clinical surgery at the University of Arkansas School of Medicine; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons; past president and secretary of the Arkansas Medical Society; past president of the state board of health, and the school board of Little Rock; proprietor of St. Luke's Hospital; aged 62; died, February 2, at Hot Springs National Park, of heart disease.

Frank Donaldson Moore ⊕ Chicago; College of Physicians and Surgeons, Chicago, 1899; formerly associate professor of surgery at his alma mater; member of the American College of Surgeons; vice president and on the staffs of the Garfield Park and Frances Willard hospitals and on the staff of the Mother Cabrini Memorial Hospital; aged 60; died, January 28, of heart disease.

Jasper Halpenny, Harlingen, Texas; University of Manitoba Faculty of Medicine, Winnipeg, Manit., Canada, 1900; emeritus professor of surgery at his alma mater; member of the American College of Surgeons; formerly on the staffs of the Winnipeg General and the Grace hospitals; aged 61; died, Dec. 19, 1930, of arteriosclerosis and pneumonia.

Tecumseh Kingsley Holmes, Chatham, Ont., Canada.; Long Island College Hospital, Brooklyn, 1865; Medical Department of Columbia College, New York, 1866; Victoria University Medical Department, Coburg, Ont., Canada, 1867; past president of the Canadian Medical Association; aged 91; died, Dec. 25, 1930.

William Cowen, New York; Medical Department of Columbia College, New York, 1883; member of the Medical Society of the State of New York, American Otological Society and the American College of Surgeons; on the staffs of the People's and Lebanon hospitals; aged 69; died, January 26, of pneumonia.

Richard Griffen Savoye, Westfield, N. J.; New York Homeopathic Medical College and Hospital, 1906; member of the Medical Society of New Jersey; president of the board of health of Westfield; aged 49; died, January 19, in the Montclair (N. J.) Community Hospital, of acute myocarditis.

Dennis David Crowley ⊕ Oakland, Calif.; Bennett College of Eclectic Medicine and Surgery, 1879; College of Physicians and Surgeons, Chicago, 1885; member of the American College of Surgeons; aged 73; died, Dec. 28, 1930, in the Providence Hospital, of cerebral hemorrhage.

John Arthur Ruan, Beacon, Iowa; Central Medical College of St. Joseph, 1900; member of the Iowa State Medical Society; formerly member and president of the school board; aged 59; died, January 12, in the Lutheran Hospital, Des Moines, of pneumonia, following an abdominal operation.

Sampson Busby Allen, Charlottesville, Va.; Bellevue Hospital Medical College, New York, 1879; formerly on the staffs of the Manhattan Eye and Ear Hospital and the New York Eye and Ear Infirmary, New York; aged 77; died, February 4, of cerebral arteriosclerosis.

Joseph Addison Patton, Stilwell, Okla.; Hospital College of Medicine, Louisville, 1892; member of the Oklahoma State Medical Association; secretary of the Adair County Medical Society; county superintendent of public health; aged 62; died, Dec. 5, 1930, of nephritis.

Benjamin Franklin Wray, Camden, Ind.; Indiana University School of Medicine, 1911; member of the Indiana State Medical Association; served during the World War; formerly member of the state legislature; aged 47; died, February 4, of heart disease.

Clifford R. Spain, Arkansas City, Kan.; Northwestern University Medical School, Chicago, 1903; member of the Kansas Medical Society; on the staff of the Mercy Hospital; aged 54; died, January 11, of cardiorenal disease and hypertension.

Edward Fenton Cooke ⊕ Houston, Texas; Fort Worth School of Medicine, 1897; member of the Society of American Bacteriologists and the American Society of Clinical Pathologists; aged 55; died, January 8, of chronic myocarditis.

Jesse W. McClure ⊕ Milan, Ind.; Hospital College of Medicine, Louisville, 1898; Medical College of Indiana, Indianapolis, 1904; formerly coroner of Jennings County and Ripley County; aged 65; died, January 26, of gastric ulcer.

Andrew H. Starcke, Kansas City, Mo.; Kansas City Hemeopathic Medical College, 1895; member of the Associated Anesthetists of the United States and Canada; aged 56; died, February 3, in the Evangelical Hospital, of intestinal obstruction and carcinoma of the colon.

Siegmund Albert Reich ✠ Jersey City, N. J.; College of Physicians and Surgeons, Baltimore, 1902; on the staff of the New York Post Graduate Medical School and Hospital, New York; aged 52; died, February 5, of angina pectoris.

James Nimmo Ellis, Atlanta, Ga.; Medical College of Virginia, Richmond, 1889; member of the Medical Association of Georgia and the American College of Surgeons; aged 67; died, February 11, of carcinoma of the tongue.

William Edward Price, Meredithville, Va.; University of Virginia Department of Medicine, Charlottesville, 1882; member of the Medical Society of Virginia; aged 70; died suddenly, January 22, of cerebral hemorrhage.

Roswell C. Basinger ✠ Jackson, Miss.; Tulane University of Louisiana School of Medicine, 1923; member of the Medical Association of the State of Alabama; aged 31; died suddenly, January 31, in a local hospital.

Carmillus Turner Warner ✠ Marlboro, Mass.; University of Vermont College of Medicine, Burlington, 1885; aged 66; on the staff of the Marlboro Hospital, where he died, January 18, of chronic cholecystitis.

Ora George Daniels ✠ Canton, Mass.; Harvard University Medical School, Boston, 1909; for twenty years senior member of the staff of the Massachusetts Hospital School; aged 53; died, February 3, of pneumonia.

Bernard Roger Coleman, Troy, N. Y.; Albany Medical College, 1920; member of the Medical Society of the State of New York; aged 36; died, January 14, of acute uremia, acute nephritis and rheumatic fever.

Oscar D. Swoyer, Allentown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1878; for many years member and president of the school board in South Bethlehem; aged 75; died, Dec. 19, 1930.

Frank Salter Nicholson, St. Paul, Neb.; Trinity Medical College, Toronto, Ont., Canada, 1894; member of the Nebraska State Medical Association; aged 58; died, Dec. 10, 1930, of carcinoma of the stomach.

Ernest Luther Bullard ✠ Rockville, Md.; Rush Medical College, Chicago, 1883; member of the American Psychiatric Association; aged 71; died, January 17, in Rockingham, N. C., of dilatation of the heart.

William Dodge, Los Angeles; College of Physicians and Surgeons, Keokuk, Iowa, 1878; past president of the Los Angeles County Medical Society; aged 73; died, January 23, of coronary sclerosis.

Walter M. Dalbey, Wheeling, W. Va.; Baltimore Medical College, 1902; member of the West Virginia State Medical Association; aged 56; died, January 9, in San Bernardino, Calif., of pernicious anemia.

William Livingston Hartman, Pittston, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1866; member of the Medical Society of the State of Pennsylvania; aged 87; died, January 13.

Henry D. Worth, Bangor, Maine; Medical School of Maine, Portland, 1878; member of the Maine Medical Association; for twelve years member of the state board of health; aged 80; died, January 26.

Ashton Earl Neely ✠ Surg., Lieut. Commander, U. S. Navy, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1915; aged 41; died, January 28, in the U. S. Naval Hospital.

Arthur L. Fanning, Providence, R. I.; College of Physicians and Surgeons, Boston, 1907; formerly on the staff of St. Joseph's Hospital; aged 54; died, January 11, of pulmonary tuberculosis.

John W. Donges, Camden, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1866; member of the Medical Society of New Jersey; aged 86; died, February 5, in Miami, Fla.

Richard Ridgley Lytle, New York; University of Virginia Department of Medicine, Charlottesville, 1877; aged 78; died, January 31, in St. Luke's Hospital, of carcinoma of the small intestine.

Canning T. Bell, De Kalb, Miss.; Memphis (Tenn.) Hospital Medical College, 1901; member of the Mississippi State Medical Association; aged 52; died, January 26, of heart disease.

Lincoln Arden Wheelock ✠ East Cleveland, Ohio; Medical Department of Western Reserve University, Cleveland, 1900; aged 65; died, January 24, in Brooksville, Fla., of angina pectoris.

Corydon De Kalb Bundy, Kankakee, Ill.; College of Physicians and Surgeons, Chicago, 1902; aged 58; died, January 12, in Newport Ritchey, Fla., of myocarditis and hypertension.

Charles Ives Pegues, Safford, Ala.; Medical Department of the Tulane University of Louisiana, New Orleans, 1893; aged 70; died, January 12, at Dunedin, Fla., of bronchopneumonia.

Lawrence George Distler ✠ Middletown, N. Y.; University and Bellevue Hospital Medical College, 1899; medical inspector of the public schools; aged 54; died suddenly, January 7.

Arthur Lauer, Brooklyn; University and Bellevue Hospital Medical College, 1911; member of the Medical Society of the State of New York; aged 41; died, February 3, of pneumonia.

Alexander Cromwell Mavety, Toronto, Ont., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1889; aged 78; died, Nov. 4, 1930, in St. Joseph's Hospital.

Julius Evan Lewis, Washington, D. C.; George Washington University Medical School, Washington, 1928; aged 31; died, Dec. 1, 1930, while at sea, of heart disease.

William M. Garretson ✠ Anderson, Ind.; Medical College of Indiana, 1882; aged 70; died, January 27, in a hospital at Indianapolis, of cerebral hemorrhage.

George Balmer, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1898; aged 61; died, Nov. 25, 1930, in the Toronto General Hospital.

William Jeffries Newbill, Irvington, Va.; University of Maryland School of Medicine, Baltimore, 1868; Confederate veteran; aged 84; died, Dec. 15, 1930.

Alfred Gaither, Cincinnati; Miami Medical College, Cincinnati, 1897; aged 67; died, January 29, of chronic myocarditis, interstitial nephritis and bronchitis.

Frederick W. Pulford, Detroit; McGill University Faculty of Medicine, Montreal, Que., Canada, 1880; aged 72; died, January 15, in Sandwich, Ont.

George Winter Whitney, New York; New York Homeopathic Medical College and Hospital, 1903; aged 51; died, Dec. 29, 1930, of arteriosclerosis.

Charles W. Noss ✠ Altoona, Pa.; College of Physicians and Surgeons, Baltimore, 1907; aged 49; died, Oct. 26, 1930, of carcinoma of the colon.

Davis Ankeny Dean, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1891; aged 63; died, January 27, of cerebral hemorrhage.

Tillis Gandy ✠ Royce, Miss. (licensed, Mississippi, 1911); aged 45; died, January 31, in the Methodist Hospital, Hattiesburg, of pneumonia.

Willis J. Peak, Oakland, Ill.; St. Louis Medical College, 1861; Civil War veteran; aged 93; died, January 17, of chronic interstitial nephritis.

Charles Eugene Swift ✠ Elkins, Ark. (licensed, Arkansas, 1903); aged 56; died, January 10, of injuries received in an automobile accident.

Henry L. Older ✠ Morenci, Mich.; Michigan College of Medicine and Surgery, Detroit, 1895; aged 62; died, January 30, of heart disease.

Theodore Griffin, Kansas City, Kan.; Cleveland Medical College, 1868; Civil War veteran; aged 88; died, January 5, of myocarditis.

Alson Emery Ingersoll, Fresno, Calif.; Hahnemann Medical College and Hospital, Chicago, 1871; aged 82; died, Nov. 15, 1930.

Barton S. Sheffer, St. Joe, Ind.; Cleveland Medical College, 1877; aged 83; died, January 5, of cerebral hemorrhage.

John Charles Drexler, Brandon, Minn. (licensed, under the Act of 1887); aged 79; died, January 22, of arteriosclerosis.

John W. Mott, Los Angeles; Rush Medical College, Chicago, 1883; aged 88; died, January 23, of chronic nephritis.

Charles Robert Oglesby, Bartow, Fla.; St. Louis Medical College, 1876; aged 79; died, January 16, of heart disease.

John William Schmidt, Brookview, Md. (licensed, Maryland, year unknown); aged 82; died, in October, 1930.

Bureau of Investigation

MORE MISBRANDED NOSTRUMS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

Walker's Old Indian Fever Tonic.—Bostwick Bros., Atlanta, Ga., shipped in June, 1929, into Florida a quantity of Walker's Old Indian Fever Tonic that was declared misbranded. Analysis showed the product to consist essentially of epsom salt, quinine sulphate, a small amount of arsenic, alcohol and water, colored with a pink dye and flavored with oil of cinnamon and other aromatics. The claims that it was a remedy for malarial fever, intermittent fever, typhoid fever, influenza, jaundice, measles, etc., were declared false and fraudulent, and in September, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16939; issued September, 1930.*]

Zunical.—Antonio A. Zuniga of New York City shipped in February, 1929, into California more than a hundred bottles of Zunical, which were declared adulterated and misbranded. Analysis showed the product to consist essentially of eggs, creosote, copaiba, sugar and water. The product was declared adulterated because of the claim on the package that the preparation was antiseptic, when it was not; the curative claims, to the effect that it was a remedy for asthma, bronchitis, influenza, whooping cough, etc., were declared false and fraudulent. In August, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16942; issued September, 1930.*]

C. C. T. Antiasthmatic (Hare).—The Shores-Mueller Company, Cedar Rapids, Iowa, shipped in July, 1929, a quantity of C. C. T. Antiasthmatic (Hare) that was declared misbranded. The charge was based, first, on the fact that while the tablets were claimed to contain 2 grains of potassium iodide, they actually contained less than half a grain, and while they were labeled as containing 2 grains of sodium bromide, they actually only contained a little over half a grain. The therapeutic claims, to the effect that it was a remedy for asthma, were declared false and fraudulent. In December, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 17074; issued November, 1930.*]

Rice's Cough Syrup.—The Rice Chemical Company, Greensboro, N. C., shipped in January, 1929, into Virginia a quantity of Rice's Cough Syrup that was declared misbranded. Analysis showed the product to consist essentially of extracts of plant drugs, including white pine, wild cherry, sassafras and bloodroot, in a mixture of alcohol, glycerin, sugar and water. The claims that the preparation was a remedy for coughs, croup, influenza, whooping cough, etc., were declared false and fraudulent, and in September, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16949; issued September, 1930.*]

Oxidine.—W. S. Kirby, Dallas, Texas, shipped in June and July, 1929, a quantity of Oxidine and Tasteless Oxidine that was declared misbranded. On analysis, Oxidine was found to consist essentially of quinine sulphate (about 2½ grains to the ounce), cinchonine sulphate (about 2.8 grains to the ounce), extracts of a laxative plant drug, glycerin, sugar, alcohol and water. The so-called Tasteless Oxidine was reported to consist essentially of cinchonidine sulphate, oil of peppermint, sugar, alcohol and water. It was falsely and fraudulently represented as a food digester, a liver and kidney medicine, a remedy for influenza, and various other conditions. In December, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 17055; issued November, 1930.*]

Glykeron.—Iglesias and Company, New York, shipped in April, 1929, to San Juan, Porto Rico, a quantity of Glykeron that was declared misbranded. Analysis showed the product to consist essentially of codeine phosphate, an ammonium salt, extracts of plant drugs, glycerin, alcohol, sugar and water. The claim that it was a remedy for coughs, bronchitis, pneumonia, whooping cough, asthma, etc., was declared false and fraudulent, and in February, 1930, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 17078; issued December, 1930.*]

Vicine.—The Vicine Products Company, Memphis, Tenn., shipped in July, 1929, a quantity of Vicine that was declared misbranded. Analysis showed the product to consist essentially of iron sulphate, small amounts of phosphates, calcium salts and sulphuric acid in water. It was labeled as a "powerful germicide," when, as a matter of fact, bacteriological examination showed that it was not germicidal. The curative claims, to the effect that it was a remedy for rheumatism, neuritis, bedwetting, sluggish liver, intestinal trouble, cramps, ptomaine poisoning, pimples, halitosis, and dandruff, were declared false and fraudulent and in December, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 17077; issued December, 1930.*]

Neo-Syn.—The Neo-Syn Company of Minneapolis shipped in December, 1928, into Wisconsin 360 boxes of Neo-Syn, which were declared misbranded. Analysis showed the product to contain acetphenetidin (phenacetine), aspirin, caffeine and starch. The claim that Neo-Syn was absolutely safe was declared false and misleading; furthermore, the declaration of the presence of acetphenetidin was in inconspicuous type and did not include a statement to the effect that acetphenetidin is a derivative of acetanilid. The curative claims that the preparation was a remedy for neuralgia, influenza, backache, periodic pains, etc., were declared false and fraudulent, and in June, 1929, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16945; issued September, 1930.*]

Bradfield's Female Regulator.—The Bradfield Regulator Company, Atlanta, Ga., shipped in June, 1929, a quantity of J. Bradfield's Female Regulator, which was declared misbranded. Analysis showed the product to consist essentially of extracts of plant drugs, including a laxative, glycerin, alcohol and water. The claims that it was a remedy for irregularities of the menstrual function and for the treatment of nonsurgical cases of weaknesses and disorders of the female generative organs were declared false and fraudulent, and in January, 1930, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 17073; issued November, 1930.*]

Tanna-Menthol.—The Tanna-Menthol Company, Inc., Enid, Okla., shipped in December, 1929, a quantity of Tanna-Menthol that was declared misbranded. Analysis showed the product to consist essentially of potassium iodide, menthol, iodine, tannic acid, glycerin, alcohol and water. The claim that it was a remedy for influenza, sore throat, pyorrhea, etc., was declared false and fraudulent, and in February, 1930, the court declared the product misbranded and ordered it released to the Tanna-Menthol Company, Inc., on the execution of a bond, conditioned in part that it be relabeled truthfully, and that the company pay the costs.—[*Notice of Judgment 17085; issued December, 1930.*]

Inhalet.—The Lobe Manufacturing Company, Middleboro, Mass., shipped in December, 1929, into New York a quantity of Inhalet that was declared misbranded. Analysis showed the article to consist essentially of menthol. The claims that the preparation was a remedy for neuralgia, catarrh, influenza, hay fever, asthma, etc., were declared false and fraudulent, and in January, 1930, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16948; issued September, 1930.*]

Correspondence

PERINEAL OR "COCCYGEAL" HERNIA

To the Editor:—In The Journal, Nov. 22, 1930, page 1588, G. A. Pagenstecher reports a case of "coccygeal" hernia. The anatomic boundaries he gives this hernia are those of posterior perineal hernia.

He also states that "no case of coccygeal hernia is on record in the present literature." This statement is incorrect, and if allowed to stand may lead bibliographers into serious error. Though rare, there are several cases of posterior perineal hernia recorded in the literature, probably the earliest being Papen's case, described in a letter to Haller, in 1750 (Haller: Disputationes chirurgicae selectae, Laussannae **3**:313-316, 1755). Scarpa described the anatomy of posterior perineal hernia in his monograph Sull' ernia del perineo, Pavia, 1821.

In 1924 I collected a number of these cases from the literature and made a special study of the anatomy of posterior perineal hernia, all of which is described and fully illustrated in my book on Hernia, pages 486-498. Piersol's Anatomy gives a brief description of this hernia.

It is unfortunate that this rare and interesting case of posterior perineal hernia should have been reported as a "coccygeal" hernia.

Leigh F. Watson, M.D., Los Angeles.

"PLASTIC REPAIR OF INGUINAL HERNIA"

To the Editor:—The Journal for Nov. 15, 1930, contains an article by Joseph A. Pettit, M.D., Portland, Ore., in which the author states: "About the time this technic was brought out Skillern presented a plastic flap technic lacking in the essential advantages presented by mine." And on the next page Pettit writes further: "I find three distinct disadvantages in the Skillern operation, in which the lower or lateral flap is plicated beneath the upper or medial flap: (1) It is not possible to make so extensive a plication; (2) it is not possible to construct a new fascial canal for the structures of the cord without producing an additional curve having a sharp and disadvantageous angulation, and (3) the general reconstruction is anatomically incorrect."

The article describing the operation referred to was published in 1922 (Skillern, P. G.: The Choice of Operation in Inguinal Hernia, *Surg. Gynec. Obst.* **34**:230 [Feb.] 1922) and is quoted by Dr. Seward Erdman in the chapter on hernia in Nelson's Living Surgery **4**:589).

Pettit's article is a discussion of the well known essentials of hernia technic, and his method is a combination of the Bassini and Andrews methods.

In my own article, Tom Jones's illustrations and the legends beneath them (especially figures 2, 3 and 5) show clearly the distinguishing feature of the operation, namely, the approximation and suture of a stout cylinder of aponeurosis-covered musculature (i. e., the rectus edge ensheathed in its fascial coverings) to Gimbernat's and Poupart's ligament. There is now established the strongest possible barrier against recurrence—far stronger than the usually thin and weak conjoined tendon used in the Bassini method. Now, with this as the fundamental barrier, the flaps of external oblique aponeurosis are utilized to take up the strain on the sutures that hold the rectus mass in the concavity of Poupart's ligament, rather than of themselves to form a barrier by imbrication, as in the Andrews method, which Pettit uses. This, then, is my answer to Pettit's first criticism: by plicating the lower flap first I get a firmer grip on the rectus mass to hold it down in place; this is my aim, regardless of the extent of the plication.

As to Pettit's second criticism, which concerns the formation of a new fascial canal for the cord, my answer is that I don't form a new fascial canal, contrary to his statement, and as he himself practices. Stettin, as well as Erdman, supports me in this, that the cord interposed between the flaps prevents their agglutination, adding "Nor is it necessary to cover the cord which, experience has shown, causes absolutely no symptoms when placed in the subcutaneous position."

As to Pettit's final criticism, that the general reconstruction is anatomically incorrect, my answer is, first, that I am unaware of any postulates having been laid down the fulfilment of which constitutes an anatomically correct operation for hernia; secondly, is it possible for a hernia operation to be anatomically correct? And, finally, should an operation that is successful in preventing recurrence of hernia be discarded, even though it is "anatomically incorrect"?

In my article, close study of Tom Jones's illustrations and the legends beneath them will give a clear conception of the technic. I suggest that if the author reviews my operation from this standpoint he will no longer find it, as he writes, "lacking in the essential advantages presented by mine."

P. G. Skillern, M.D., South Bend, Ind.

THE GRAVES SYNDROME

To the Editor:—Your editorial on the Graves syndrome in the issue of Dec. 27, 1930, and its criticism by Percy Fridenberg, January 31, page 376, merit further comment. Fridenberg asserts that the psychic factor "is certainly not of prime importance and probably not essential to the development of the disease. The emotional symptoms are possibly a result, not a cause, of the disease."

The average clinician must heartily agree with the implications in your editorial and with the views of Eli Moschcowitz (The Nature of Graves' Disease, *Arch. Int. Med.* **46**:610 [Oct.] 1930), A. S. Warthin (The Constitutional Entity of Exophthalmic Goiter and So-Called Toxic Adenoma, *Ann. Int. Med.* **2**:553 [Dec.] 1928) and others in the opinion that exophthalmic goiter, whatever its ultimate cause, is a constitutional disorder in which the psyche is of major etiologic importance. Life is too limited to comprehend the ultimate cause of any phenomenon; hence in the investigation of cause we must content ourselves with the limitations of the humanly tangible.

In a paper of ten years ago (The Psychic Factor in Exophthalmic Goiter, The Journal, July 23, 1921, p. 282) I urged that this syndrome is not goiter and that the sooner this condition is removed from the classification of goiter the sooner will a rationalization of therapeusis be effected. Eight years ago (The Prevention of Exophthalmic Goiter, *Endocrinology* **7**:415 [May] 1923) I pointed out that hereditary influences play an important part in susceptibility; that this predisposition may become intensified by factors acquired through errors in the conduct of life or through maladaptation to the world at large; and that in nearly every case of exophthalmic goiter there was superimposed on predisposition an exciting factor usually in the nature of psychic trauma to account for the onset of the syndrome. The following earmarks of susceptibility may be discerned in predisposed individuals: (1) heightened cerebration, asserting itself chiefly in mental alertness and often an aptitude for singular accomplishment; (2) emotional instability expressing itself particularly in deficient inhibition, calm and poise; (3) an excitable heart and labile pulse; (4) vasomotor ataxia; (5) sparkling eyes which during conversation and active attention may suggest exophthalmos, and (6) undue palpability of the thyroid gland. The most noteworthy characteristic of this class of humanity is a lowered threshold of emotional reaction. In a more recent paper based on a study of 3,343 cases of exophthalmic goiter personally followed up for years (Psychic Trauma in Pathogenesis of Exophthalmic Goiter, *Endocrinology* **11**:106 [March-April] 1927) I found that at least 2,842, or 85 per cent, presented a clear history of psychic

trauma as the exciting cause of the disease. It would therefore appear that the psychic factor plays a major rôle in the evolution of the Graves syndrome and that this approaches its etiology more closely than any other factor.

ISRAEL BRAM, M.D., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

OCCURRENCE OF EPIDEMIC INFLUENZA IN CYCLES

To the Editor:—What are the indications for influenza epidemics this winter? I have read that the disease occurs epidemically in cycles and can usually be predicted in advance. Please omit name.

M.D., Missouri.

ANSWER.—It would probably be more accurate to say that influenza occurs in "waves" rather than in cycles. The word "cycle" is a more specific term than waves and refers to waves that occur in approximately equal intervals of time. Some writers have argued that influenza occurs in a rather short cycle and that when the period for an epidemic falls in the warm weather no epidemic occurs. They thus account for the unequal intervals that occur between epidemics of influenza. The assumption of any length cycle in epidemics of influenza comes far from describing the actual intervals that have occurred between epidemics in past years. Since the pandemic of 1918-1919, which had its major peak in October, there have occurred six fairly definite epidemics that were more or less national in extent. Three of these epidemics had their peaks in February, one in January, one in March and one in May. The years were 1920, 1922, 1923, 1926, 1928 and 1929. It will be seen that the times that epidemics have occurred vary both in intervals between the epidemics and in the months in which the epidemic occurs. In view of these facts, it does not seem possible, with our present knowledge, to make any prediction as to whether or not an epidemic might be expected in the near future.

Going back to former years, there was a series of epidemics in the decade following 1890 and extending into the first year or two of the next decade. After these epidemics were over there was little indication of excess mortality from influenza for a period of nearly fifteen years, when the epidemics that occurred in the two or three years prior to 1918 began. If the story should be repeated in a similar fashion, we may be beginning on a period when few epidemics will occur, or we may be due for further epidemics in the near future. There seems no basis for telling which will be true, nor, in fact, is there any basis for assuming that the story of the last decade of the last century will be repeated at this time.

STATUS OF VITAGLASS

To the Editor:—Kindly inform me as to the present status of "Vitaglass." Please omit name.

M.D., New York.

ANSWER.—Vitaglass is the trade name for one of many patented ultraviolet transmitting mediums that pass ultraviolet radiations more or less freely. Some mediums transmit the radiations better than others. Pure, colorless quartz, for example, is an excellent transmitter of ultraviolet radiation, with an efficiency of 92 per cent or more in the therapeutic zone. Common window glass does not transmit ultraviolet radiation in this region.

The therapeutic zone is recognized by authorities as that small band of radiation in the vast electromagnetic spectrum having wavelengths from 2,800 to 3,100 angstrom units approximately. Authoritative evidence shows that these wavelengths are recognized as effective in preventing rickets and in the activation of ergosterol. This ultraviolet energy is present in sunlight, and that reaching the earth in the summer is more abundant than that in the winter.

The Bureau of Standards Research Paper 113 records that vitaglass of thickness 2.3 mm. has, at a wavelength of 3,020 angstrom units, an average transmitting efficiency of nearly 25 per cent. More recent tests by the Bureau of Standards (Department of Commerce, Bureau of Standards, report on solarization of vitaglass, letter filed with Council on Physical Therapy, Sept. 20, 1930) place the transmission efficiency of vitaglass of thickness 2.3 mm., after solarization, at 42 per cent. Furthermore, recent tests conducted by the Massachusetts Institute of Technology (Stockbarger, D. C., and Johnson, L. B.: Stabilization of Special Ultraviolet Transmitting Glasses Commercially on the Markets, *J. Franklin Inst.* **210**:455 [Oct.] 1930) indicated that samples solarized in the same manner had a transmission efficiency as high as 47 per cent at 3,025 angstrom units. The improvement in the manufacture of the product may account for the wide discrepancies in these results; however, the product varies widely from batch to batch.

A recent medical note published in the *Scientific American* (Coblentz, W. W.: Ultraviolet Transmitting Glasses, abstr. *Scient. Am.*, December, 1930, p. 467) suggested 30 per cent or higher as the minimum efficiency of ultraviolet transmitting mediums at 3,020 angstrom units. Therefore, the purchaser of vitaglass should protect himself by contracting with the dealer to furnish glass whose transmission shall, after stabilization of exposure, not fall below the efficiency stated.

In a recent test completed by the Detroit department of health (City of Detroit, Department of Health, *Weekly Health Review*, Oct. 25, 1930) twenty-seven children between the ages of 11 and 14 attended classes in a schoolroom glazed with vitaglass, while thirty-six children of the same age studied in rooms glazed with ordinary window glass. The group's score in the vitaglass room was 82.1, whereas the average score of the children in the room glazed with ordinary glass proved to be 82.6. From this investigation it appears that the window glass group had a little of the advantage. If a greater number of children had been examined, however, it is probable that the values would have been nearly the same. In other words, there was no indication that children attending rooms glazed with vitaglass were perceptibly improved over those children who attended rooms glazed with ordinary glass.

POMPHOLYX OR RINGWORM DERMATITIS

To the Editor:—Is pompholyx contagious? Kindly outline a course of treatment.

M.D., Indiana.

ANSWER.—A few of the vesicular eruptions on the soles may be due to other causes, but authorities agree that most cases formerly called pompholyx are cases of vesicular ringworm dermatitis. They are therefore infectious to a moderate degree. No single plan of treatment will succeed in all cases. Perhaps the best course for the vesicular and bullous cases is to open the larger lesions and apply cool wet dressings of liquor alumini acetatis diluted with 15 parts of distilled water or saturated boric acid solution. Or the parts may be painted daily with a strong solution (from 0.5 to 1 per cent) of potassium permanganate. Evidence of complicating pus infection (ascending lymphangitis) should be watched for, as these vesicular cases afford an excellent atrium for such infections. As the case improves, Whitfield's ointment (6 per cent of salicylic acid and 12 per cent of benzoic acid in petrolatum or ointment of rose water) may be used in place of the wet dressing or the paint.

Many other methods of treatment are used: tincture of iodine, from 3 to 10 per cent; ointment of ammoniated mercury (iodine and mercury preparations should not be used at the same time for fear of dermatitis); mercurochrome-220 soluble solution, from 2 to 5 per cent; x-ray exposures, from ⅛ to ¼ erythema dose once a week (irritating drugs should not be used at the same time for fear of dermatitis); chrysarobin ointment, from 2 to 5 per cent, and many others. The plan mentioned is, however, the one most often successful. To avoid recurrence, treatment should be kept up, in diminishing intensity, for some time after apparent recovery.

PSYLLIUM — PARA-PSYLLIA

To the Editor:—I note that one of the pharmaceutic houses in the Central West advertises a solution of psyllium seed and petrolatum under the name of Para-Psyllia. The formula given is as follows: liquid petrolatum heavy, 80 per cent; psyllium seed jelly to make 100 per cent. Does the psyllium jelly have any therapeutic effect?

C., Indiana.

ANSWER.—The psyllium in this preparation is used simply as an emulsifying agent. It has no more effect on the therapeutic value of this preparation than has the agar in the agar liquid petrolatum emulsions.

In the case of the former, the manufacturer informed the A. M. A. Chemical Laboratory that the actual amount of psyllium seed represented in Para-Psyllia was less than 1 per cent. In the case of agar liquid petrolatum emulsions, analyzed

by the laboratory a few years ago, the average amount of agar found was also less than 1 per cent. In other words, these preparations are dosage forms of liquid petrolatum, having the advantage of being in the form of emulsions, which are better liked by some than the liquid petrolatum alone.

Para-Psyllia has not been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies. The name is not informing of the active ingredient.

STUDY OF POSTPOLIOMYELITIC COMPLICATIONS

To the Editor:—In 1887, a woman had an attack of anterior poliomyelitis. She was then 19 years of age. The paralysis affected the lower part of the spine and both legs. There has been a persistent weakness in these muscles, with considerable backache at times almost incapacitating the patient. Recently there was a severe twinge of pain which seemed to result in a partial paralysis, which was only temporary. Her physician diagnosed a stroke. It is my guess that she suffered a subluxation or twist of the weakened spinal column, resulting in a temporary inflammatory condition of the cord. Whatever the condition was, it has cleared up. There still remains the old postpoliomyelitic weakness of the muscles. Have you any suggestions to offer as to the type of treatment suitable in such a case? Is electricity in any form likely to prove beneficial in a case of forty-three years' standing?

CHARLES T. SHARPE, M.D., New York.

ANSWER.—In view of the fact that incomplete data have been given, some of the statements in this answer may be irrelevant. If both legs and the lower part of the spine are affected, it is evident that a spine brace and two long leg braces should be of value. The spine brace should be of a type known as a corset spine brace, which consists of uprights and pelvic band and crutches for under the arms. The material is canvas, with lacings in the front or side. The leg braces should have lock joints at the knees and limited joints at the ankles. They may have calipers and they may have a molded foot plate. Massage should be of value; underwater gymnastics are valuable. Lowman described them in THE JOURNAL, March 22, 1930, page 845. Muscle training, that is, reeducation of weakened muscles, is of value. The patient has probably had some of these physical agents. Electricity is of definite value as a muscle tonic in that it maintains the circulation at a high level. Roentgenographic examination should be made of the projections centered over the fifth lumbar vertebra for evidence of spondylolisthesis; that is, a forward slipping of the fifth lumbar on the sacrum. Roentgenograms should also be made of the hips for evidence of partial or complete dislocation.

EFFECTS OF CHLORAL HYDRATE ON CONJUNCTIVA

To the Editor:—Some time ago I read in one of the standard authors, either H. C. Woods, Jr., Bastedo or Cushing on Materia Medica, that chloral hydrate when used for several days often caused severe pain in the eyes or eyeballs, but I have never been able since to locate exactly where I found this information. I have noted its occurrence frequently with patients and I want to confirm this information so I can convince several physicians on the subject. Could you give me this information authoritatively and state where it can be found?

F. F. YOUNG, M.D., Covington, Ind.

ANSWER.—Irritation of the conjunctiva is one of the most frequent untoward symptoms of chloral hydrate, showing itself in redness and swelling of the conjunctiva, which, however, disappear shortly after the discontinuance of the drug (Lewin, Lewis: Untoward Effects of Drugs, Detroit, George S. Davis, 1883, p. 161). This, perhaps, accounts for the symptoms observed.

BILATERAL SCIATIC PARALYSIS AFTER CHILDBIRTH

To the Editor:—A woman, aged about 31, in her second and last labor, occurring five years ago, suddenly noticed a complete paralysis of both lower limbs. Instruments were used, effecting an immediate delivery, but the paralysis persisted. I saw her about a month later, at which time she had begun to improve. Improvement was gradual but complete after about eighteen months. Now, because of the death of the older child, she desires to become pregnant and has asked me if there will be any likelihood of the condition recurring during a pregnancy or labor. Her pelvic measurements are normal or possibly a little contracted.

M.D., Iowa.

ANSWER.—This case is most likely one of bilateral obstetric sciatic paralysis. Only a small number of such cases have been reported in the literature. The cause in nearly all of the reported cases was increased intrapelvic pressure producing trauma to the sciatic nerves. This increased pressure is due to one or more of the following factors: disproportion between the size of the mother's pelvis and the child's head; prolonged or difficult labor, and instrumental delivery. The symptoms generally appear immediately after delivery but are frequently delayed for a number of days. Both legs are involved and there are both motor and sensory changes. The prognosis is doubtful in most cases. In some instances there is rapid improvement, whereas in others a permanent drop foot remains as a residue. Since the patient referred to made a complete recovery, there is no reason why she should not become pregnant again. The most certain way to eliminate the danger of a recurrence of the paralysis is to perform a cesarean section at term but before labor has begun. There is, however, a case report of a perineal paralysis which occurred during the sixth month of pregnancy. Since in the present case the paralysis occurred before delivery was accomplished, it would most likely be advisable to deliver the child by the abdominal route at or near term. An excellent article on this subject is by Samuel Kleinberg in *Surgery, Gynecology and Obstetrics* **45**:61 (July) 1927.

ALKALOID IN SUSPENSION RATHER THAN SOLUTION

To the Editor:—In Marriott's recent work on "Infant Nutrition," under the subject of rhinopharyngitis, the following prescription is given:

	Gm. or Cc.
Ephedrine (alkaloid)	0.5
Neosilvol	1.5
Aquae dest., q. s. ad	30.0

As it is my understanding that the alkaloid is insoluble in water, would you kindly advise me how a solution is brought about?

ANGUS B. COWAN, M.D., Fresno, Calif.

ANSWER.—In this case the alkaloid is intended to be in suspension; the neosilvol favoring this by the gelatin it contains. It is doubtful whether this is a good form in which to prescribe ephedrine, unless used within a short time after preparation; ephedrine, according to the recent work of Drs. Moore and Moore of Indianapolis, decomposes in presence of moisture and light. Solutions of ephedrine sulphate or ephedrine hydrochloride, however, are apparently stable.

USE OF SUPRARENAL CORTEX

To the Editor:—In a case of asthenia with weakness, nervousness and cardiac arrhythmia, would the administration of suprarenal cortex be indicated? In what form it is best employed? Would the prolonged use of a salt-free diet tend to aggravate the symptoms? Please omit name.

M.D., New York.

ANSWER.—It is difficult to give a definite answer. Koehler's extract, which has been supplied through the courtesy of the University of Chicago, occasionally has had effect in patients with weakness and nervousness. So far as we know, it has never had any effect in cardiac arrhythmia. The cortical hormone of Swingle and Pfiffner is reported to be specific in its effect, and there is no evidence that it would have any effect on this clinical syndrome unless it was associated with Addison's disease or possibly some other endocrine disease. With this combination of symptoms, it might be well to investigate whether there is any evidence of hyperthyroidism. It is extremely unlikely that a salt-free diet could be a factor, unless it interfered with the patient's appetite.

POSSIBLE DIAGNOSIS OF ANEURYSM

To the Editor:—A man, aged 23, whose work is rapid and strenuous, putting in meters, has had dyspnea and cough regularly at 4 a. m. for the last four months, lasting for half an hour, or until considerable expectoration takes place. There is some cough during the day, which is worse in damp weather. Night sweats exist, but no chills or loss of weight. There is no anorexia. His weight is 148 pounds (67 Kg.). He is very tired at the end of a day's work, and nervous. Physical examination shows that the lungs are clear; the heart rate is 120 with no enlargement. A systolic thrill is heard at the base of the heart. Blood pressure is 140 systolic and 80 diastolic. Double murmur is heard at the aortic valve and a systolic murmur at the pulmonic area on exercise. The murmurs are loudly transmitted to the carotid arteries. No increased retromanubrial dulness was found. A fine tremor of the tongue and fingers was observed. The reflexes were hyperactive, the pupils reactant. One blood Wassermann reaction was plus-minus. Because two company doctors said he was all right, he was not studied again. With this insufficient data, can aneurysm give such an interesting chief complaint? If not, what? Please omit name.

M.D., New York.

ANSWER.—From the meager facts given, it is difficult to make a correct diagnosis. There are two possibilities: 1. That the patient is suffering from the effects of aortic regurgitation and that his apparent myocardial weakness in the early morning is a manifestation of his lack of reserve in the myocardium. 2. In

spite of the fact that he has lost no weight, hyperthyroidism should be seriously considered. Aneurysm cannot be seriously considered without more data than have been given. A roentgenogram of the chest should also be made and several metabolism studies should be undertaken. In addition, the patient should be put to bed for at least a week to see what effect the rest has on his pulse rate.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, March 3, 1931. Sec., Dr. Harry C. De Vighne, Juneau, Alaska.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination in nineteen cities in the United States and Canada. March 14, 1931. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh, Pa.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Philadelphia, June 8, 1931. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago, Ill.

CALIFORNIA: Reciprocity, San Francisco and Los Angeles, March 18, 1931. Sec., Dr. C. B. Pinkham, 420 State Office Bldg., Sacramento, Calif.

CONNECTICUT: Homeopathic, New Haven, March 10, 1931. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven, Conn.

MAINE: Portland, March 10-11, 1931. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Maine.

MONTANA: Helena, April 7, 1931. Sec., Dr. S. A. Cooney, Power Block, Helena, Mont.

NEW HAMPSHIRE: Concord, March 12-13, 1931. Sec., Dr. Charles Duncan, Concord, N. H.

NEW MEXICO: Santa Fe, April 13-14, 1931. Sec., Dr. W. T. Joyner, 20-21 First National Bank Bldg., Roswell, N. M.

OKLAHOMA: Oklahoma City, March 10-11, 1931. Sec., Dr. J. M. Byrum, Shawnee, Okla.

PORTO RICO: San Juan, March 3, 1931. Sec., Dr. Diego Biascoechea, Box 804, San Juan, P. R.

WISCONSIN: Madison, March 21, 1931. Basic Science. Sec., Prof. R. N. Bauer, 3414 W. Wisconsin Ave., Milwaukee, Wis. Milwaukee, April 14, 1931. Reciprocity Applications. Sec., Dr. R. E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

Rhode Island October Examination

Dr. Lester A. Round, director of the State Public Health Commission of Rhode Island, reports the written and practical examination held at Providence, Oct. 2-3, 1930. The examination covered 7 subjects and included 70 questions. An average of 80 per cent was required to pass. Sixteen candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1927)	85.4
Rush Medical College		(1930)	85
Boston University School of Medicine		(1930)	83.2
Harvard University Medical School		(1899)	82.8
Middlesex College of Medicine and Surgery		(1930)	90.3
Tufts College Medical School		(1924) 88.3, (1928)	88.2
Baltimore Medical College		(1899)	87.5
College of Physicians and Surgeons, Baltimore		(1893)	82
St. Louis University School of Medicine		(1928)	85
Washington University School of Medicine		(1923)	86.8
Columbia Univ. College of Physicians and Surgeons		(1928)	84.1
Cornell University Medical College		(1928)	91.4
Long Island College Hospital		(1911)	90.3
Medical College of Virginia		(1926)	87.1
McGill University Faculty of Medicine		(1923)	90

Idaho October Examination

Hon. F. E. Lukens, commissioner of law enforcement of Idaho, reports the oral and written examination held at Boise, Oct. 7, 1930. The examination covered 13 subjects and included 130 questions. An average of 75 per cent was required to pass. Four candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1930)	80
University of Illinois College of Medicine		(1930)	84
University of Nebraska College of Medicine		(1929)	79
University of Oregon Medical College		(1929)	88

Mr. Lukens also reports 4 physicians licensed by the endorsement of credentials at the same meeting. The following colleges were represented:

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
Rush Medical College	(1929) N. B. M. Ex., (1923),	(1929)	Illinois
University of Michigan Medical School		(1926)	Michigan

Wyoming October Examination

Dr. W. H. Hassed, secretary of the Board of Medical Examiners of Wyoming, reports the written examination held at Cheyenne, Oct. 6, 1930. The examination covered 13 subjects. An average of 75 per cent was required to pass. One candidate was examined and passed. The following college was represented:

College	PASSED	Year Grad.	Per Cent
University of Oregon Medical School		(1924)	84.5

Dr. Hassed also reports 4 physicians licensed through reciprocity with other states at the same meeting. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Kansas School of Medicine		(1923), (1929)	Kansas
Creighton University School of Medicine		(1929)	Nebraska
University of Nebraska College of Medicine		(1929)	Nebraska

Nevada November Examination

Dr. Edward E. Hamer, secretary of the Medical Board of Nevada, reports the written examination held at Carson City, Nov. 25, 1930. The examination covered 15 subjects and included 110 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. The following college was represented:

College	PASSED	Year Grad.	Per Cent
University of Buffalo School of Medicine		(1923)	83

Dr. Hamer also reports one physician licensed through reciprocity with another state at the same meeting. The following college was represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Toronto Faculty of Medicine		(1928)	Michigan

Book Notices

THE TREATMENT OF ASTHMA. By A. H. Douthwaite, M.D., F.R.C.P., Assistant Physician, Guy's Hospital. Cloth. Price, 7/6. Pp. 164. London: H. K. Lewis & Co., Ltd., 1930.

The author has endeavored to epitomize the present knowledge of asthma, with especial regard to treatment. This book is intended to help out the recent concerted activities of the Asthma Research Council, activities that are arousing the keen interest of many not only in Great Britain and other parts of Europe but also in this country. The author divides asthma into two groups: (*a*) primary, including those patients suffering since childhood, and (*b*) secondary, including those cases which occur after puberty or middle age and follow some respiratory disorder, such as influenza. The first type corresponds to our allergic group, or true bronchial asthma. The second includes chiefly the nonallergic or asthmatic bronchitis cases. He pays particular attention to the deformities that arise in chronic cases, including emphysema and other chest complications. He lays much stress on Oriel's recent work on isolation from the urine of a proteose excreted during an attack in the allergic type of asthma and in many other allergic diseases. This proteose, when isolated and injected intradermally in minute doses even as low as one part in a million, produces a positive reaction; it has no effect on normal individuals, nor is an active substance of this nature to be found in their urine. This proteose disappears between attacks. As to etiology he is fair and gives allergens, local irritants, reflex stimulation and psychic influences their proper places. He advocates intradermal tests only if scratch tests are negative. He errs, however, in stating that "in the case of children it is seldom practicable to perform skin tests because of the fear induced by scalpel or hypodermic needle," for it is in children that the tests are especially indicated. The remainder of the book is devoted to treatment. The usual drugs are mentioned with the sound advice to avoid morphine unless absolutely necessary. Specific allergic treatment is emphasized and the rarity of cure by nasal operations. Vaccines are recommended in infectious cases. Physical exercises and massage are stressed at length. A book containing much valuable information.

GRUNDLAGEN UND ENTWICKLUNGSGESCHICHTE DER KINDLICHEN NEUROSE. Von Erich Benjamin. Eine ärztlich-pädagogische Studie. Paper. Price, 9 marks. Pp. 144, with 5 illustrations. Leipzig: Georg Thieme, 1930.

The author of this little treatise is a children's specialist, not a psychiatrist or a psychologist. He has made his observations at the bedside and in the consulting room. His experience is that of a general practitioner. He believes that the neuroses and psychoses are intimately associated with the constitutional fabric of the individual. He stresses Kretschmer's views, which deal with the relationship of physical type of body and character. He believes that mentality or its perversions, like physique and its variations, are to a greater or lesser degree inherited. He has collected a number of typical cases illustrating tics and neuroses, which he describes in effective detail. He studies the period of rebellious stubbornness ("trotz periode"), which commonly manifests itself about the second year. This is the period when the child begins to recognize to some extent that he must adapt himself in some degree to his environment. He comes in contact with the world and with people. Where the adjustment does not take place readily, the child shrinks from his social contacts and seeks to isolate himself or withdraw from the group, and his behavior may become of the infantile or dependent type. He has developed asocial attitudes which may express themselves in the form of speech disturbances, paroxysms of rage, tantrums, anorexia and vomiting. The author bases his observations on the clinical study of 205 children. He believes that every neurosis and psychopathic manifestation has its origin in early childhood. He thinks that the neuroses in boys manifest themselves differently than in girls. In the former it is more common to find some evidence of an arrest of psychic development. Anorexias, sleep disturbances, vomiting and fear occur more frequently in girls than in boys. As a rule, the girls made better progress in school than the boys. In contrast to this the boys were restless, presented choreiform symptoms, and showed lack of independence, speech difficulties and inability to concentrate. Both boys and girls of this group show lack of confidence and deficiency in initiative. Benjamin is of the opinion that the inferiority complex, physical defects and sexual emotions play a considerable part in the causation of neuroses but are of secondary nature, not primary. Sexuality, he thinks, is an expression of the individual's social reaction and the author interprets sexuality in that light. Benjamin emphasizes the importance of early prophylaxis and treatment. Since he maintains that neuroses and psychoses have their origin early in life, the home and the school should combine to give appropriate training and instruction to prevent the formation of nervous habits and tendencies.

TREATMENT OF EPILEPSY. By Fritz B. Talbot, M.D., Clinical Professor of Pediatrics, Harvard University Medical School. Cloth. Price, $4. Pp. 308. New York: Macmillan Company, 1930.

This monograph has been written with a great deal of thought toward compiling the various theories regarding the etiology and pathology of epilepsy. A thorough discussion of these phases of the epileptic problem precedes the body of the book, which is concerned with treatment. The author has been known for his consistent and intelligent research on the metabolism of epilepsy and the ketogenic diet therapy in epilepsy. He discusses almost all the modern treatments of epilepsy, including drug treatment and dehydration. His consideration of the technic of the ketogenic diet is masterful and well supplied with practical details. Any one who is concerned with the therapy of epilepsy can secure in this book both a general survey of the field and detailed instructions for the actual technic.

HYPERSENSIBILITÉS SPÉCIFIQUES DANS LES AFFECTIONS CUTANÉES: ANAPHYLAXIE, IDIOSYNCRASIE. Par Pasteur Vallery-Radot, professeur agrégé à la Faculté de médecine, médecin des hôpitaux, et Mlle. V. Heimann, interne des hôpitaux. Paper. Price, 25 francs. Pp. 146. Paris: Masson & Cie, 1930.

Mention of the name Vallery-Radot gives assurance of the value and dependability of this book. The book is written in Vallery-Radot's simple, clear, readable style which makes it equally useful to specialists and to general practitioners. They give an interesting review of the experimental phases of anaphylaxis, take up the clinical phases of the subject, including diagnostic methods, and, finally, show the relationship of various dermatoses such as urticaria, angioneurotic edema, eczema, erythema, pruritus and prurigo to hypersensitiveness to foreign matter. They believe that before a skin disorder can be classified as definitely allergic in origin, it should be proved to be due to sensitiveness to foreign material. They think that such a conclusion should not be based on the mere finding of an eosinophilia or through obtaining relief by so-called shock therapy. They do not include sensitiveness to the action of physical agents in this study, although they recognize its practical importance.

INSTITUTE OF INTERNATIONAL EDUCATION: ELEVENTH ANNUAL REPORT OF THE DIRECTOR. SOME REFLECTIONS ON AMERICAN EDUCATIONAL INSTITUTIONS ABROAD. INSTITUTE ACTIVITIES. Paper. Pp. 55. New York: Institute of International Education, 1930.

This bulletin contains the eleventh annual report of the director of the Institute of International Education. It outlines the activities of the institute during the past year in fostering friendly international educational and cultural relations between the United States and Europe, Latin America, the Near East and the Far East. Lists of visiting scholars, publicists, teachers and journalists are included. The report is supplemented by statistical tables of foreign students in American colleges and universities, the distribution of foreign students by institutions in the United States, and a statistical summary by countries of foreign students in the United States.

TECHNIQUES HISTOLOGIQUES DE NEUROPATHOLOGIE. Par Ivan Bertrand, directeur à l'École Pratique des Hautes Études. Préface du Professeur G. Guillain. Paper. Price, 50 francs. Pp. 375. Paris: Masson & Cie, 1930.

The remarkable growth of neurology was unquestionably due mainly to the progress of neuropathology. Clinical observations are especially valuable when supported by pathology. The famous school of French neurologists—Charcot, Raymond, Dejerine, Pierre Marie—always laid stress on pathology, and the present head of the neurologic service at the Salpêtrière, Professor Guillain, is the most eager follower of the tradition of the French school of neurology. His chief of the laboratory at the Salpêtrière rendered an exceptional service to neuropathology by publishing his book. The methods of neuropathology research, mainly those of staining, became alarmingly numerous and even confusing. Almost every neuropathologist of prominence prefers certain methods or devises methods of his own. For a beginner in neuropathology, and a general pathologist, it is not easy to become oriented in the mass of staining methods recommended for routine or research work. The existing manuals are either too short or one sided, or compiled by persons who have no personal experience with the majority of methods used. These shortcomings are practically eliminated in the book of Bertrand. Himself a brilliant student and contributor to the science of neuropathology, Bertrand had an extensive experience with the numerous methods which he describes in a clear, precise manner. An interesting chapter is devoted to cell studies in infra-red rays and their use in photomicrography of the central nervous system. The book is undoubtedly a valuable contribution and should be in the hands of every pathologist.

PHYSICAL DIAGNOSIS. By Warren P. Elmer, B.S., M.D., Associate Professor of Clinical Medicine, Washington University School of Medicine, and W. D. Rose, M.D. Sixth edition. Cloth. Price, $10. Pp. 903, with 337 illustrations. St. Louis: C. V. Mosby Company, 1930.

At the request of the publishers, Dr. Elmer has taken over the task of completely revising Dr. Rose's work on physical diagnosis, which had gone through five editions. Much of the original has been retained, certain chapters have been rewritten, numerous additions have been made, and the whole has been rearranged to fit more nearly the needs of medical students. As it now stands, the book is admirably fitted to be used as a textbook for teaching physical diagnosis. The first part is devoted to the technic of complete physical examination of patients, including examination of the abdomen and extremities, as well as special examinations by such physical means as the x-rays and the electrocardiograph. Anatomic landmarks and surface anatomy are well presented. The second part covers the physical diagnosis of diseases of the respiratory and circulatory systems. In many respects the work fills a long felt need in supplying a modern American textbook on physical

diagnosis in which no part of the body is excluded. The work is profusely illustrated; photographs, drawings, roentgenograms and electrocardiograms are used. In the original editions of Rose, many illustrations from other works were freely used; in the present volume greater originality is shown, and it is hoped that in future editions much more of originality will be attempted. The volume is appropriately dedicated to Dr. George Dock, whose chief interest was the teaching of medical students.

DIE AVERTINNARKOSE IN DER CHIRURGIE. Von Professor Dr. W. Anschütz, Direktor der Chirurg. Klinik Kiel, Dr. K. Specht, Assistent der Chirurg. Klinik Kiel, und Priv.-Doz. Dr. Fr. Tiemann, Assistent der Mediz. Klinik Kiel. Paper. Pp. 406-605, with 9 illustrations. Berlin: Julius Springer, 1930.

This monograph of 200 pages comprises 15 chapters with some 60 subdivisions arranged conveniently for reference; a table of contents; an alphabetical bibliography of nearly 400 references, and, in addition, numerous references relating to allied subjects in footnotes. The subjects discussed include (with their subdivisions) the chemistry of "Avertin"; preparation of the patient; dosage; methods in common use by different surgeons; basal or full narcosis; supplementary (inhalation, local) anesthesia; failures; absorption; time of onset of anesthesia; duration and termination of anesthesia; side actions; deaths, and indications and contraindications. The various subjects are not treated with equal comprehensiveness, but the authors have presented a summary of the voluminous literature with clarity, though perhaps from a somewhat too optimistic standpoint. This is illustrated by the fact that while there is a table presenting 103 deaths that have been reported as being due to "Avertin" (not always so considered by the operator), they exclude 74; the authors consider only 12 as certainly attributable to "Avertin" and 17 as questionably so. Every one who has attempted to analyze the reports of deaths due to anesthetics has encountered difficulties that make it impossible to determine the exact number of fatalities, but several who have studied the literature of "Avertin" believe that it has caused more than 29 deaths. There is hardly one of the fifty or more subdivisions relating to the use of "Avertin" concerning which there is not a diversity of opinion. The authors discuss nine types of the more frequently used methods of employing "Avertin," and these do not include the intravenous method suggested by Kirschner, which is also considered separately. The discussion of dosage and that of indications and contraindications with the diversity of opinion show that there is much to learn before the use of "Avertin" can be established on a scientific basis. It is hardly necessary to state that no one should undertake to anesthetize a patient with "Avertin" before he has studied the subject in great detail and with great care, and even then one must proceed cautiously until one has acquired experience—after which one will probably be even more cautious.

TECHNIQUE AND RESULTS OF GRAFTING SKIN. By H. Kenrick Christie, M.S., F.R.C.S., Hon. Surgeon, the Hospital, Wanganui, N. Z. Cloth. Price, 7/6. Pp. 67, with 35 illustrations. London: H. K. Lewis & Company, Ltd., 1930.

The material forming the basis of this monograph was obtained largely from a series of about thirty cases of skin grafting on chronic ulcers of the leg. In a few instances, skin grafting was done on other portions of the body, especially the hands and the face. General considerations, including the anatomy, are first briefly discussed. The indications for grafting are followed by a discussion of the choice of the Wolff full thickness skin graft, the Thiersch graft, and the tubed pedicle grafts, with their technic and after-treatment. The subsequent history of these grafts on leg ulcers is made possible by a follow-up in about fifteen cases traced two or three years later. It was found in these cases that Wolff grafts were the most satisfactory method of treating chronic ulcers of the leg. The ulcer was excised, including the fibrous base, bone or tendon was exposed if necessary, and the full thickness skin graft was placed over and the edges were sutured. It was observed that portions might slough occasionally, but the main mass remained in spite of some infection. Later, the remaining raw areas were Thiersch grafted. In a few cases, ulcers developed in adjacent areas but the full thickness graft remained intact. The title of the book is somewhat misleading. It should read "Technique and Results of Grafting Skin for Chronic Ulcers of the Leg."

THERAPIE IN EINZELDARSTELLUNGEN: WISSENSCHAFTLICHE GRUNDLAGEN UND PRAKTISCHE ANWENDUNG. Herausgegeben von Prof. Dr. R. von den Velden und Priv.Doz. Dr. P. Wolff. Insulintherapie einschliesslich der Indikationen bei nichtdiabetischen Erkrankungen. Von Prof. Dr. E. Frank, Primärarzt der medizinischen Abteilung des Städt.-Wenzel-Hancke-Krankenhauses in Breslau, und Dr. A. Wagner, Sekundärarzt der medinischen Abteilung des Städt.-Wenzel-Hancke-Krakenhauses in Breslau. Paper. Price, 4.80 marks. Pp. 99. Leipzig, Georg Thieme, 1931.

This well written monograph gives a brief but systematic survey of the therapeutic uses of insulin. It opens with a brief review of the historical aspects of the subject and the orthodox views as to the physiology of insulin. The discussion of the treatment of diabetes mellitus and diabetic coma is conservative and presents no innovations. Little space is devoted to consideration of dietary measures. As might be expected, the section devoted to synthalin therapy evinces a belief in its efficacy and freedom from danger not shared by all workers in this field. A section is devoted to insulin therapy of nondiabetic conditions. The conditions discussed are underweight and anorexia, parenchymatous liver disturbances, vomiting and dehydration, hyperthyroidism, infections and trophic disturbances. The authors believe that insulin may be of real value in the treatment of such conditions. This section may interest many who find little of particular moment in the first portion of the volume. The appendix contains tables of the composition and caloric value of common foodstuffs, and a basic diet according to Joslin. A subject index completes the volume. As the title indicates, the authors have presented a good bird's-eye view of insulin therapy, with little or no attempt to delve into the nature of the conditions treated.

EMERGENCY SURGERY. Volume I: Abdomen and Pelvis. By Hamilton Bailey, F.R.C.S. Cloth. Price, $8. Pp. 380, with 324 illustrations. New York: William Wood & Company, 1930.

This book deals with the treatment of urgent surgical conditions affecting the abdomen and pelvis. It is the first volume of a two volume work. Assuming that the diagnosis is made in each case, the author proceeds in the most painstaking detailed manner with the treatment of the condition presented from the indications through the various steps of the operations to the closure of the abdomen, including, in most cases, the immediate postoperative care. The dangers and pitfalls that may occur are mentioned and adequate advice given as to how to avoid them. The procedures and operations chosen in each case are standardized, modern, and fully described. The book contains a vast amount of reliable information well arranged and stated simply, yet clearly and forcefully. It is interesting to note that transfusions of saline solution, dextrose and blood are extensively used and advised in urgent surgery. The only point on which one may differ with the author is in his treatment of gastric tetany, for which, among other things, parathyroid extract is advised but no saline solution. Numerous excellent and lucid illustrations, some of them in color, add enormously to the value of the book and clarity of the text. The bibliography is short, the references being carefully selected and properly limited to the requirements of the average reader. Obviously the author has had an extensive experience with emergency surgery. The teachings embodied in his book will prove valuable to young surgeons and will fill a useful niche in the libraries of those more mature.

EINFÜHRUNG IN DIE PATHOLOGISCHE HISTOLOGIE DER WICHTIGSTEN PULPA- UND KIEFERERKRANKUNGEN SOWIE DER HAUPTSÄCHLICHSTEN TUMOREN DER MUNDHÖHLE. Von Dr. Alfred Kühn, Privatdozent am zahnärztlichen Univ.-Institut zu Leipzig. Paper. Price, 6 marks. Pp. 57, with 74 illustrations. Leipzig: Georg Thieme, 1930.

As stated by Römer in the introduction, this book presents the most important pathologic changes in the teeth and adjacent structures, including tumors, in the form of characteristic photomicrographs and a short descriptive text. In spite of the high degree of condensation, the descriptive matter is clear and well written. The choice of material is excellent and inclusive, the photographs are of a high grade and made from well prepared specimens, the reproductions maintain the same high standard of quality, and the paper and printing are of the best. Teachers, students and practitioners can profit from the use of this guide to outline courses, to provide suitable illustrations where such material is lacking, and to direct the study of prepared specimens.

Medicolegal

Emergency Operation Under a Workmen's Compensation Act

(Ocean Accident & Guarantee Corporation v. Nance (Texas), 25 S. W. (2d) 665)

An employee, in the discharge of her duties, was struck in the side with a pole. She was operated on for traumatic appendicitis. Thereafter she brought suit to recover compensation under the workmen's compensation act. The jury, on special issues submitted to them, found that the appendicitis resulted from the blow, that she was incapacitated, and that she incurred certain expenses for medical services. They found, however, that before undergoing the operation the injured employee did not request her employer to furnish medical and surgical services. Judgment in her favor resulted, and the insurance carrier appealed to the Court of Civil Appeals, San Antonio, Texas.

The insurance carrier contended, among other things, that the operation was performed contrary to the provisions of section 12e of art. 8306, Revised Statutes of Texas, which provides that when an employee is injured and a surgical operation will effect a cure or materially and beneficially improve his condition, the employee may demand such an operation. The demand must be made in writing. The Industrial Accident Board must then order a medical examination, and the physician must make a written report. If by the examination, report of facts, and opinions of experts, all reduced to writing and filed with the board, it is shown that an operation is advisable, the board must so state in writing, and on a unanimous order of the board in writing, a copy of which must be delivered to the employee and to the association, must direct the employee at a time and place therein stated to submit himself to an operation for the injury.

While this "red tape," said the court, is being wound and unwound, the spirit of the poor employee may have winged its flight to a fairer and better region. In a case of acute appendicitis, as the present case seems to have been, delay is thought to be dangerous in the extreme, and an operation swiftly demanded. The tediousness of the Industrial Accident Board and its reports in writing, slow and uncertain, are placing the life or death of the employee at stake and, like unto the English "Circumlocution Office" so graphically described by Charles Dickens in his "Bleak House," are hanging the employee in the dreadful balance between two eternities. No law can enforce such an absurdity against a human being. The injured employee was in a hospital suffering from an infection which threatened death. She was in no condition to go through winding mazes of a circumlocution office. In a case of grave emergency, an injured employee should be permitted to recover compensation authorized by the statute, even though the very tedious process set out in the statute for obtaining the services of a surgeon are not complied with. The court was nevertheless of the opinion that there should be clear allegations of the emergency and full proof to sustain the allegations before a recovery should be allowed. As these conditions were not complied with in the pleadings, the judgment of the lower court was reversed and the case remanded.

Failure to Remove Placenta

(McDaniels v. Moth (Iowa), 230 N. W. 311)

The plaintiff sued the defendant-physician for malpractice. She alleged that when he attended her in childbirth he negligently failed to remove parts of the placenta, which decomposed and caused septicemia. At the conclusion of her evidence, the court directed a verdict in the physician's favor and she appealed to the Supreme Court of Iowa.

Medical experts for the patient, said the Supreme Court, testified that septicemia would be the natural and probable result of retention of parts of the placenta and that if the physician had examined the placenta he might have determined approximately whether or not any part of it had been retained. But, said the court, it does not appear that even if he had made such an examination some parts of the placenta might not still have been retained. If he had discovered that the placenta had not been expelled, he might, according to the plaintiff's medical experts, have properly relied on the removal of the débris from the uterus by hemorrhage, which might go on for a week or so. If he had attempted artificial removal of the retained parts of the placenta, he might have exposed the plaintiff to the danger of infection from sources other than the retained placental tissue. The defendant-physician, therefore, according to the evidence, was compelled to exercise his judgment. There was no evidence that good practice or ordinary care required him to make exploration and removal, and thereby take the chance of setting up another infection. His failure, if there was any, to inform himself adequately did not cause the infection. If he had learned of the retention of a part of the placenta, it does not appear that proper practice and due care would have required him to remove them by artificial means, or in time to prevent infection from the retained tissue. Even if he had by artificial means removed the placental tissue, infection from that act or from some other source might have resulted. Granting that he omitted to make an examination and to remove retained placental tissue, there was no evidence to indicate that he failed in the exercise of the knowledge and care ordinarily exercised by physicians in the same locality or similar localities, or in the exercise of due care. The judgment of the trial court, in favor of the defendant-physician, was therefore affirmed.

Workmen's Compensation Acts: Infection Under a Callosity Compensable.—The claimant operated a listing machine, requiring about 10,000 operations daily. A callosity formed on a finger, and infection developed under the callous area, necessitating an operation and causing permanent disability. Under the circumstances, said the Supreme Court of Tennessee, the employee might well have expected a callosity to appear on her finger tip, as they often do on the finger tips of stenographers and violinists. The appearance of an infection, however, was something fortuitous, not to be expected, an unusual event or result, and therefore accidental. If it be argued that the callosity required too long to develop to be regarded as an accident, it may be answered that it is not the callosity but the superadded infection which constituted the injury, and that this manifested itself suddenly. The injury was therefore compensable.—*Sears-Roebuck & Co. v. Starnes (Tenn.), 26 S. W. (2d) 128.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Birmingham, April 21-24. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association for the Study of Goiter, Kansas City, Mo., April 7-9. Dr. J. R. Yung, 670 Cherry Street, Terre Haute, Ind., Secretary.

American Association of Anatomists, Chicago, April 2-4. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.

American Association of Pathologists and Bacteriologists, Cleveland, April 2-3. Dr. H. T. Karsner, 2085 Adelbert Road, Cleveland, Sec'y.

American College of Physicians, Baltimore, March 23-27. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

American Orthopedic Association, Memphis, Tennessee, April 15-18. Dr. DeForest P. Willard, 1916 Spruce Street, Philadelphia, Secretary.

American Pediatric Society, Edgewater Park, Mississippi, April 15-17. Dr. H. C. Carpenter, 1805 Spruce Street, Philadelphia, Secretary.

American Physiological Society, Montreal, April 8-11. Dr. Arno B. Luckhardt, 5216 Greenwood Avenue, Chicago, Secretary.

American Society for Experimental Pathology, Montreal, April 8-11. Dr. C. Phillip Miller, Jr., University of Chicago Department of Medicine, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Montreal, April 8-11. Dr. E. D. Brown, University of Minnesota Medical School, Minneapolis, Secretary.

American Society of Biological Chemistry, Montreal, April 8-11. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Mich., Secretary.

Arkansas Medical Society, Texarkana, April 21-24. Dr. William R. Bathurst, Boyle Building, Little Rock, Secretary.

Federation of American Societies for Experimental Biology, Montreal, April 8-11. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Mich., Secretary.

Louisiana State Medical Society, New Orleans, April 14-16. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.

North Carolina, Medical Society of the State of, Durham, April 20-22. Dr. L. B. McBrayer, Southern Pines, Secretary.

Southeastern Surgical Congress, Atlanta, Ga., March 9-10. Dr. B. T. Beasley, 45 Edgewood Ave., Atlanta, Ga., Secretary.

Tennessee State Medical Association, Knoxville, April 14-16. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Psychiatry, Baltimore

10: 365-549 (Nov.) 1930

Unconditioned and Conditioned Reactions to Pain in Schizophrenia. L. Bender and P. Schilder, Baltimore.—p. 365.
Modern Treatment of Mental Disorders in German Hospitals. M. Weygandt, Hamburg.—p. 385.
Biochemistry of Brain Blood by Internal Jugular Puncture. A. Myerson and R. D. Halloran, Boston.—p. 389.
Erythremia (Polycythemia) with Psychosis. M. Levin, Philadelphia.—p. 407.
*Thyroid Factor in Dementia Praecox. R. G. Hoskins and F. H. Sleeper, Worcester, Mass.—p. 411.

Thyroid Factor in Dementia Praecox.—Among 130 subjects of dementia praecox reported on by Hoskins and Sleeper, a group of 18 were diagnosed as suffering from thyroid deficiency. Of these, 16 received thyroid treatment. Significant mental improvement followed in 14, or 88 per cent of the cases, and 5 patients became well enough to go home. In a control group of 41 patients receiving similar treatment, the incidence of significant improvement was 34 per cent. There was probably some degree of thyroid deficiency in various subjects of the control group since 31 were recorded as showing "endocrine deficiency unclassified." A considerable number of the control subjects received other than thyroid medication, which probably contributed to the improvement shown. In general, cases presenting a favorable initial prognosis were excluded from treatment. The results of the study are interpreted as indicating that thyroid deficiency plays a significant part in more than 10 per cent of state hospital cases of dementia praecox and that in properly selected cases thyroid medication in adequate dosage and for a sufficiently prolonged period results in significant improvement. On the other hand, relatively little success is to be anticipated from thyroid medication in cases selected at random.

Archives of Neurology and Psychiatry, Chicago

25: 1-226 (Jan.) 1931

*Anastomosis of Nerves. C. Ballance, London.—p. 1.
*Pathologic Changes in Paralysis Caused by Drinking Jamaica Ginger. A. R. Vonderahe, Cincinnati.—p. 29.
*Congenital Cerebral Cysts of Cavum Septi Pellucidi (Fifth Ventricle) and Cavum Vergae (Sixth Ventricle): Diagnosis and Treatment. W. E. Dandy, Baltimore.—p. 44.
*Clinical Syndrome of Corpus Callosum. B. J. Alpers and F. C. Grant, Philadelphia.—p. 67.
Spasmodic Lateral Conjugate Deviation of Eyes. C. Davison and S. P. Goodhart, New York.—p. 87.
Syphilis (?) of Oculomotor Nerve. G. B. Hassin, Chicago.—p. 116.
Encephalography. C. D. Camp and R. W. Waggoner, Ann Arbor, Mich.—p. 128.
*Arsenic in Spinal Fluid: Quantitative Estimation Following Intravenous Administration of Tryparsamide and Silver Arsphenamine. L. H. Cornwall, H. A. Bunker and C. N. Myers, New York.—p. 137.
*Manic-Depressive Psychosis: Hereditary Factors and Clinical Course. H. A. Paskind, Chicago.—p. 144.
Ophthalmoplegia Internuclearis and Other Supranuclear Paralyses of Eye Movements. W. F. Moncreiff, Chicago.—p. 148.
Priapism as Early Symptom in Multiple Sclerosis. S. D. Wilgus and E. W. Fell, Rockford, Ill.—p. 153.
Inability to Laugh Audibly: Aphonogelia. M. Levin, Philadelphia.—p. 157.
Quantitative Pupiliary Light Reflex. L. Lehrfeld, Philadelphia.—p. 159.
Malignant Tumor of Solar Plexus. F. C. Helwig, G. H. Hoxie and E. L. Miller, Kansas City, Mo.—p. 162.

Anastomosis of Nerves.—Ballance relates the results of experiments in which the central end of the divided cervical sympathetic nerve was anastomosed to the peripheral end of the divided facial nerve and to the peripheral end of the divided hypoglossal nerve. Complete functional and anatomic recovery of the striated muscles of the face, tongue and depressor muscles of the hyoid bone and larynx were observed. No muscle fibers of the face or tongue muscles or of the sternohyoid or sternothyroid muscles appeared to be atrophied as they should be if a dual innervation was necessary for complete restoration of function. The sympathetic nerve fibers seem to join at the anastomoses with the larger cranial nerve fibers and there is no evidence in the microscopic sections that they continued into the cranial nerve trunks. Ballance inclines to the belief that these experiments give support to the view that the anatomic and functional perfection of striated muscle depends on a dual innervation.

Pathologic Changes in Paralysis Caused by Drinking Jamaica Ginger.—Four cases of poisoning with commercial extract of jamaica ginger are reported by Vonderahe. One case is reported in detail. This case was uncomplicated by other pathologic factors and involved death by ascending paralysis and bulbar involvement. The pathologic studies revealed degenerative changes in the radial and anterior tibial nerves, degenerative changes in the anterior roots, and marked pathologic changes in the anterior horn cells, characterized by swelling, chromatolysis, eccentric nuclei and death of the cells, and occasionally by shrinking of the cells. Central chromatolysis was the predominating type of cell change. All sections showed infiltration with amyloid bodies. The sensory nuclei were only slightly affected. The fiber tracts of the brain stem and spinal cord remained unaffected. Severe cellular changes, similar to those found in the anterior horn cells, were noted in the hypoglossal nucleus and the dorsal motor nucleus of the vagus and nucleus ambiguus. There were no pathologic signs of inflammation, no phagocytic glia cells, lymphocytes, polymorphonuclear leukocytes or endothelial cells. The pathologic observations suggest a toxin which reaches the peripheral nerves in the extremities through the circulation but which subsequently travels into the central nervous system along the nerve fibers and anterior roots. Thus, in addition to the central chromatolysis in the motor cells of the anterior horn, associated with involvement of the peripheral nerve, diffuse chromatolysis and death of the cells also occur. The toxin, in severe cases, may then make its way to the medulla, where involvement of the vagal nuclei produces death by bulbar paralysis. There is an obvious tendency of the toxin to exert its pathologic effect most severely on motor cells and fibers. The pathologic observations can hardly be regarded as characteristic of any one toxic agent. They serve to eliminate, however, all possibility of the "epidemic" being infectious in origin.

Congenital Cerebral Cysts.—Two cases of cysts of the cavum septi pellucidi and cavum vergae are reported by Dandy. In each case the two cavities were continuous. The cysts acted as tumors and caused compression of the motor tracts on both sides. Mental symptoms were decided in both cases. One patient had peculiar epileptic attacks of varying character but indicating bilateral involvement of the motor tracts. Suggestive evidence of intermittent intracranial pressure existed in both instances. The diagnosis of cysts of this type cannot as yet be made by clinical signs and symptoms. The diagnosis is easily made by ventriculography. The ventriculographic picture appears to be pathognomonic. An operation is offered for cysts of this character. One patient was well and apparently normal eight months after operation. His physical and mental status was entirely changed by correction of the underlying cause.

Clinical Syndrome of Corpus Callosum.—Alpers and Grant report five cases involving the corpus callosum. In four of the cases the tumor had spread to the surrounding brain tissue, so that more than the corpus callosum was involved. In all five cases the tumor involved the anterior portion of the corpus callosum and the frontal lobe as well. There is a clinical syndrome indicating involvement of this structure. This syndrome is most characteristic when the presenting symptoms include mental disturbances, hemiparesis and motor apraxia. A syndrome with the mental symptoms described and with hemiparesis and apraxia is almost characteristic of involvement of the corpus callosum. Less characteristic, but none the less indicative of callosal implication by tumor, is a syndrome consisting of pronounced mental symptoms with drowsiness and

hemiparesis. In addition, there may be evidences of increased pressure and dyssynergia. It is hazardous to state that such a syndrome as that last mentioned is characteristic of disease of the corpus callosum, but in the authors' experience the mental symptoms that have been found in cases of tumor of the corpus callosum are so strikingly similar in all cases as to justify the statement that in cases with evidences of increased pressure, with mental signs of apathy, indifference, lack of concentration, change in personality and occasionally psychotic manifestations, occurring in the presence of a hemiparesis or even without, a tumor of the corpus callosum should be strongly suspected. The probabilities are that in such cases a tumor will be found in this location.

Arsenic in Spinal Fluid.—Cornwall et al. conclude from their study that the favorable clinical results that have been reported in neurosyphilis as a result of treatment with tryparsamide must be ascribed to factors other than the actual quantity of arsenic that enters the spinal fluid.

Manic-Depressive Psychosis.—Four hundred and eighty-five cases of extramural manic-depressive psychosis were studied by Paskind to determine whether or not any correlation existed between familial neuropathic factors and the age of onset, the length of the attacks and the length of the intervals. A rather definite correlation was found.

Archives of Pathology, Chicago

10: 823-989 (Dec.) 1930

*Experimental Lesions of Brain from Carbon Monoxide. C. B. Semerak, Chicago, and L. H. Bacon, San Bernardino, Calif.—p. 823.
Standardized Procedure for Microscopic Studies on Heart. L. Gross, W. Antapol, G. Blumenthal, Jr., and B. Sacks, New York.—p. 840.
*Argentaffin Tumors of Small Intestine: Four Cases. G. Ritchie, Madison, Wis.—p. 853.
*Experimental Subacute Amyloid Nephrosis in Rabbits. E. M. Butt, San Francisco.—p. 859.
Pathogenesis of Bacterial Endocarditis. K. Semsroth and R. Koch, Pittsburgh.—p. 869.
Endometriomyoma of Umbilicus. N. Enzer, Milwaukee.—p. 879.
*Variation in Weight of Thyroid Gland and Frequency of Abnormal Enlargement in Region of Chicago. R. H. Jaffé, Chicago.—p. 887.

Experimental Lesions of Brain from Carbon Monoxide.—Experiments made by Semerak and Bacon demonstrate that the effect of carbon monoxide varies in different animals; that it is rapidly eliminated by rabbits and guinea-pigs; that rabbits are especially resistant to the gas, and that the weight of the animals, the amount of the gas and the manner of administration modify its action. Symmetrical lesions in the brains of the dogs and more rarely in those of guinea-pigs and rabbits, lesions resembling those occasionally found in human brains, may be produced experimentally by injecting the gas into the arterial blood stream or by having the animals inhale pure carbon monoxide or illuminating gas. When pure carbon monoxide is injected into the blood stream, it combines so rapidly with the hemoglobin that gas embolism does not occur, or at least not with doses such as were injected in these experiments. Ten cubic centimeters of air alone injected into the carotid arteries of dogs causes severe convulsions, is more frequently and speedily fatal than a similar amount of carbon monoxide, and results in fewer gross changes, these being rarely in the basal ganglions.

Argentaffin Tumors of Small Intestine.—Four cases of argentaffin tumor of the small intestine (carcinoid) are reported by Ritchie, one with mesenteric and hepatic metastases. A brief review of opinions as to the nature of these tumors is made, and the conclusions drawn are (1) that the nature of the tumors depends on the nature of the chromo-argentaffin cells of the normal intestine, not yet understood, and (2) that until this point is decided argentaffin tumors must be placed in the same category as basal cell epitheliomas of the skin, with reference to malignancy and general characteristics.

Experimental Subacute Amyloid Nephrosis in Rabbits.—A method has been found by Butt to produce amyloid nephrosis in rabbits. The production of the lesion depends on the regulation of the doses of manganese chloride given subcutaneously so as to permit chronic poisoning. The amyloid degeneration is usually limited to the kidneys, except occasionally when the spleen in addition to the kidneys may be involved. The identification of this amyloid-like substance as amyloid is based on its reaction with the stains that are considered specific for amyloid; i. e., methyl violet and iodine.

Variation in Weight of Thyroid Gland and Frequency of Abnormal Enlargement in Region of Chicago.—Jaffé asserts that the average weight of the thyroid gland in the region of Chicago is, for white men, 27.4 Gm.; for white women, 28.1 Gm.; for Negro men, 27.4 Gm.; for Negro women, 24.6 Gm.; for Mexican men, 23 Gm., and for Mexican women, 26 Gm. The greatest weight of the thyroid gland is found in white men between the ages of 20 and 30, in Negro men between the ages of 50 and 60, in white women between the ages of 30 and 50, and in Negro women between the ages of 30 and 40. Diffuse enlargement of the thyroid gland is more common in persons below the age of 50 than in those above this age. It is more frequent in the male than in the female sex. There are no differences in its incidence as between the two races. The frequency of nodose goiter increases with advancing age. It reaches its maximum in white men in the sixth, in white women in the seventh, in Negro men in the sixth and in Negro women in the sixth decade of life. Nodose goiter is more common in females than in males, and there is a greater disposition to it in the white race than in the Negro race. The percentages for nodose goiter are: white males, 30; white females, 44.7; Negro males, 14.5, and Negro females, 25.6. Sixty-nine and three-tenths per cent of goiters are nodose. The majority of nodose goiters are of moderate size; weights above 100 Gm. are rare. The nodes are usually small, seldom reaching a diameter above 4 cm.

Archives of Surgery, Chicago

22: 1-178 (Jan.) 1931

*Peritonitis: I. Correlation of Bacteriology of Peritoneal Exudate and Clinical Course of Disease in 106 Cases of Peritonitis. F. L. Meleney, H. D. Harvey and H. Z. Jern, New York.—p. 1.
Oxygen Therapy: Insufflation into Oral Pharynx. A. J. Wineland and R. M. Waters, Madison, Wis.—p. 67.
*Toxin of Bacillus Welchii in Toxemia of Acute Intestinal Obstruction. H. F. Thurston, Indianapolis.—p. 72.
Continuous Intravenous Injection of Dextrose in Ringer's Solution: Technic and Indications and New Intravenous Cannula. J. S. Horsley and G. W. Horsley, Richmond, Va.—p. 86.
*Fate of Cortical Bone Graft. C. Davison and A. Kraff, Chicago.—p. 94.
*Vaccination Against Peritonitis in Surgery of Colon. F. W. Rankin and J. A. Bargen, Rochester, Minn.—p. 98.
Ileocecal Cysts. E. Drennen, Birmingham, Ala.—p. 106.
*Closed Method of Treatment of Fractures of Ankle Joint. C. Lórenzetti, Milan, Italy.—p. 121.
*Regeneration of Hyaline Cartilage in Joints. A. R. Shands, Jr., Durham, N. C.—p. 137.

Peritonitis.—Studies made by Meleney et al. showed that the great majority of patients with peritonitis who come to a general hospital have lesions of the appendix. If the inflammation is limited in extent, the peritoneal exudate yields few organisms on smear or culture. If the appendix has not perforated, the disease is usually not fatal; whether the appendix is gangrenous or simply inflamed, the course is mild and the patients are able to return home in about two weeks. If the appendix has perforated, the inflammation is frequently extensive; the peritoneal exudate is profuse, and yields great numbers of bacteria of several different species. The disease is frequently fatal, the course is stormy, and the patient who survives has to stay in the hospital about twice as long as if it had not perforated. In gangrene of the appendix there was no evidence from an examination of the peritoneal fluid that the spore-forming anaerobic bacteria, either pathogenic or nonpathogenic, are particularly active. Perforative lesions of the small intestine promptly gave severe symptoms. Perforative lesions of the large intestine caused symptoms to develop more slowly; and in spite of the fact that they occurred in older people and that more bacteria were found both in smear and in culture, including *Clostridium welchii*, which was invariably present, the large majority of these patients, four of five, recovered. Perforative lesions of the gallbladder were always fatal. Without respect to the cause of the peritonitis in three fifths of the patients coming to the hospital within twenty-four hours in our series, the lesion was local, the symptoms were mild, the peritoneal exudate was not profuse, and organisms were rarely seen in smear or obtained in culture. Diffuse peritoneal inflammation was rarely found in cases with symptoms of less than twelve hours' duration, but usually in later cases. The

cases with diffuse peritonitis were more severe, the peritoneal fluid was profuse, and usually many organisms were seen on smear and recovered in culture. Complications were frequent, and a third of the patients died. When abscesses had formed the history was usually of long duration, although symptoms were moderately severe and there was much thick fluid containing many organisms, both on smear and on culture. The mortality was just half that of the diffuse group. Smears of the peritoneal fluid made at the time of operation and compared with the culture seemed to be of real prognostic importance. When cases of peritonitis were divided into groups according to the number of bacteria that appeared in the peritoneal exudate, it was found that thirty-five cases yielded no organisms, eleven yielded one, fourteen two, fifteen three, nineteen four, nine five, and three six species. In the great majority of cases yielding no growth, the disease was limited to the focus of infection. There were three principal bacterial species of peritoneal exudates. Nonhemolytic *B. coli* was present in 87 per cent of the cases in which bacteria were found, green streptococci were present in 49 per cent, and *C. welchii* was present in 38 per cent. Altogether, twenty-three different bacteriologic groups were recovered. Peritonitis was usually a polymicrobic disease. In only eleven of the seventy-one cases that yielded growth was a single species found. For that reason it was virtually impossible to evaluate the rôle played by each one. There were no fatal cases in the acute local peritonitis group. A third of the cases of acute diffuse peritonitis were fatal. A sixth of the cases of abscess were fatal. All but one of the deaths occurred in cases of perforative lesions in which there was not only a bacterial but a chemical and a foreign body factor. Every case of perforated ileum was fatal and only one of five in the group with perforated colon. Only one patient with a single infecting organism died; that organism was a hemolytic streptococcus. Although a third of the patients were less than 20 years of age, none of these patients died. In the next two decades only three of thirty died. After the age of 40, the mortality increased considerably with age.

Toxin of Bacillus Welchii in Toxemia of Acute Intestinal Obstruction.—Thurston failed to elicit any evidence that toxins of *B. welchii* are a factor in the toxemia of acute intestinal obstruction.

Cortical Bone Graft.—Davison and Kraft are of the opinion that an autoplastic cortical bone graft transplanted aseptically into cortical bone with perfect mechanical adaptation and fixation will heal by primary intention, with preservation of the vitality of the graft.

Vaccination Against Peritonitis in Surgery of Colon.—These studies by Rankin and Bargen emphasize the value of preoperative protection by vaccine against peritonitis in procedures in which resection of parts of the large intestine are involved. It has been amply demonstrated that protection against lethal peritonitis can be established in animals. The relatively transient nature of such immunity is noteworthy. The time element between vaccination and operation is important. The amount of vaccine injected has less significance but is important. The systemic reaction of the patient is often moderately severe but endures only a short period and is never alarming. That the logical preventive reagent is a vaccine prepared from streptococci and colon bacilli is suggested by the predominant presence of these organisms in the exudate in fatal cases of peritonitis and their vast predominance in and around malignant lesions of the large intestine.

Treatment of Fractures of Ankle Joint.—Lórenzetti believes that the closed treatment of fractures of the ankle joint, if properly employed, satisfies all the surgical indications. This statement applies to the more serious malleolar fractures with the marginal fragment of the lower end of the tibia and to those with pluridirectional displacements of the astragalus and of the foot. In 435 consecutive fractures of this type observed by him, operation has not been required.

Regeneration of Hyaline Cartilage in Joints.—Experiments have been performed by Shands on the joints of fourteen dogs to study the regeneration of the hyaline cartilage in superficial and deep defects, and of the reaction of this cartilage to direct trauma. The results of these studies show that hyaline cartilage in joints does not regenerate in less than four weeks. The best evidences of regeneration are found in twelve weeks. Regeneration of hyaline cartilage has been found in superficial defects not involving the subchondral bone. The greatest amount of regeneration, however, is seen in those deep defects which do involve the subchondral bone. Hyaline cartilage is observed to react occasionally to direct trauma with a proliferation of nests of new cartilage cells. No striking difference in the regenerative powers of cartilage in different areas of the knee joint can be demonstrated. No definite evidence of a perichondrium covering the articulating surfaces of hyaline cartilage has been observed.

Journal of Clinical Investigation, Baltimore

9: 363-554 (Dec. 20) 1930

*Tolerance of Normal Subjects to Levulose: Factors Influencing Variations in Rise in Blood Sugar. N. Jolliffe, New York.—p. 363.
*Nucleotide Therapy in Agranulocytosis. P. Reznikoff, New York.—p. 381.
*Congestive Heart Failure: VI. Effect of Overwork and Other Factors on Potassium Content of Cardiac Muscle. J. A. Calhoun, G. E. Cullen, G. Clark and T. R. Harrison, Nashville, Tenn.—p. 393.
Id. VII. Effect of Overwork on Potassium Content of Skeletal Muscle. J. A. Calhoun, G. E. Cullen and T. R. Harrison, Nashville, Tenn.—p. 405.
*Number of Formed Elements in Urinary Sediment of Patients Suffering from Heart Disease. H. J. Stewart and N. S. Moore, New York.—p. 409.
Variations of Specific Gravity of Plasma of Blood and Means Available for Altering It. N. S. Moore and H. J. Stewart, New York.—p. 423.
Optical Activity of Cerebrospinal Fluid in Suppurative Meningitis, and Its Lactic Acid, Sugar and Chloride Content. S. L. Wright, Jr., E. F. Herr and J. R. Paul, Philadelphia.—p. 443.
Proportion of Certain Important Inorganic Constituents in Dying Heart Muscle. L. C. Scott, New Orleans.—p. 463.
Carbon Dioxide and Oxygen Tensions of Mixed Venous Blood of Man at Rest. D. W. Richards, Jr., and M. L. Strauss, New York.—p. 475.
*Liver Extract, Liver Ash and Iron in Treatment of Anemia. C. S. Keefer, K. K. Huang and C. S. Yang, Peiping.—p. 533.

Tolerance of Normal Subjects to Levulose: Factors Influencing Variations in Rise in Blood Sugar.—Ninety-one levulose tolerance tests and twelve dextrose tolerance tests have been performed by Jolliffe on normal subjects under a variety of conditions. Results have been tabulated according to the fasting blood sugar level. In normal subjects the maximum blood sugar following administration of 30 to 50 Gm. (based on body weight) of levulose by mouth rarely exceeds 115 mg. per hundred cubic centimeters. A rise in blood sugar to 125 mg. or over should be considered an abnormal response to the oral administration of levulose. In the group of convalescent subjects included in this study, the levulose tolerance was the same as in the normal subjects studied. Triplicate levulose tolerance tests performed on normal subjects seven or more days apart do not show significant variation in their blood sugar curves. In normal subjects the rise in blood sugar above the fasting level following the oral administration of levulose varies inversely with the height of the fasting blood sugar level. It seems probable that there is a level of blood sugar varying from 95 to 110 mg. which, when exceeded, stimulates the sugar storage mechanism to clear the blood rapidly of its excess sugar. A period of ten or fifteen minutes elapses after this excitatory ceiling is reached before the sugar storage mechanism begins to cause a significant fall in blood sugar. The rise in blood sugar above this level depends on the rapidity of absorption of the sugar administered. The rapidity with which the blood sugar falls from its peak probably depends on the glycogen-forming ability of the sugar used.

Nucleotide Therapy in Agranulocytosis.—Reznikoff states that nucleotides given intravenously have the power of raising the peripheral polymorphonuclear count in certain agranulocytic conditions. Three patients suffering from agranulocytic angina recovered after intravenous injections of nucleotides during the course of their disease.

Effect of Overwork on Potassium Content of Cardiac Muscle.—It is believed by Calhoun et al. that overwork causes loss of potassium from heart muscle and that this loss is one of the predisposing factors to cardiac fatigue and failure.

Number of Formed Elements in Urinary Sediment of Patients Suffering from Heart Disease.—The number of casts found by Stewart and Moore in twelve hours was usually increased in patients suffering from cardiac disease, although

the number may be normal. If the average numbers are considered, the greatest numbers were passed by those patients suffering from heart failure of the congestive type; the numbers were fewer after recovery and fewer still in those who had never suffered from this illness. Granular casts were frequently found. The number of red blood cells in the urine of patients who had experienced cardiac decompensation was frequently greater than the highest normal value but within the limits in those who had never suffered from heart failure. The average number of red blood cells found in those cases which had never experienced heart failure was twice as great as that in normal individuals; in those who were suffering from heart failure or had recovered from it, however, the average number was from ten to fifteen times as great as in normal individuals. The number of white blood cells was normal in the urine of those patients who had not suffered from heart failure, but the average number was approximately twice the average observed in normal individuals. The number was usually within the normal range both during and after recovery from cardiac decompensation; the average number, however, was greater approximately nine and three times, respectively, than that in normal individuals, the average being less in patients without heart failure than in those who had recently recovered from it and less than in those who were still suffering.

Liver Extract, Liver Ash and Iron in Treatment of Anemia.—Keefer et al. report the results of a study of the effect of feeding liver extract, liver ash, and iron to patients with various forms of anemia. The following facts were evident: Liver extract was of demonstrable value in increasing the regeneration of hemoglobin in some of the obscure nutritional anemias of childhood, in some of the anemias associated with dysentery in hookworm infestation and in pregnancy. In some cases its effect could be enhanced by iron. Liver ash, when given in amounts that were equivalent to 300 Gm. of whole liver, was of little demonstrable value in increasing hemoglobin regeneration. In some cases there was a slight increase in the reticulocytes, hemoglobin and erythrocytes, but the results were never as conspicuous as those obtained with liver extract or large doses of iron. Iron was effective in the treatment of various forms of anemia. Large doses were more effective than small ones. In many instances the effect of iron exceeded liver, liver extract or liver ash, and in some cases a favorable response did not occur until iron was added. When recovery from the anemias followed either liver extract or iron, there was an increase in the reticulocytes of the circulating blood. The lower the erythrocyte count before treatment, the higher were the reticulocytes at the peak of the rise.

Laryngoscope, St. Louis

40: 867-928 (Dec.) 1930

Anesthetic Problem in Ololaryngology. R. Levy, Denver.—p. 867.
Local Anesthesia in Mastoidectomy. L. M. Hubby, New York.—p. 874.
Vasomotor Rhinitis. J. J. Pressman, Philadelphia.—p. 878.
Osteoma of Frontal Sinus. R. O. Leavenworth, St. Paul.—p. 885.
Cause and Treatment of Some Frontal Headaches. L. Weiss, Newark, N. J.—p. 892
Orientation of Sound—Probable Function of Vestibular Labyrinth. E. Roth, Flushing, L. I., N. Y.—p. 900.
Varicose Aneurysm of Auricle. F. W. Graff, New York.—p. 904.
Elongated Styloid Processes: Formation and Clinical Significance. M. M. Kulvin, Chicago.—p. 907.
Agranulocytic Angina. H. Horn, New Haven, Conn.—p. 910.
Improved Armamentarium for Tonsillectomy. H. Neivert, New York. —p. 915.
Technic of Antrostomy. R. M. Moose, San Bernardino, Calif.—p. 919.

Missouri State Medical Assn. Journal, St. Louis

28: 1-40 (Jan.) 1931

Present-Day Treatment with Female Sex Hormone. F. Emmert, St. Louis.—p. 1.
Trigeminal Neuralgia and High Blood Pressure. W. T. Coughlin, St. Louis.—p. 2.
Structural Changes in Kidneys in Hypertension and Glomerulonephritis. F. C. Narr, Kansas City.—p. 4.
Toxic Goiter: Early Symptoms, Diagnosis and Treatment: Cardiac Factor. T. H. Hanser, St. Louis.—p. 6.
Obesity: Classification and Management. A. C. Clasen and A. M. Ginsburg, Kansas City.—p. 12.
*Arthritis of Feet. J. R. Elliott, Kansas City.—p. 15.
Diagnosis of Common Anorectal Diseases. F. B. Campbell, Kansas City. —p. 16.
Intussusception: Case. E. W. Hickson, Milan.—p. 17.

Arthritis of Feet.—Elliott concludes that painful feet which do not respond to postural treatment are likely to be arthritic, with or without manifestations elsewhere in the body. Feet in which the pain is unduly severe may be presumed to be arthritic. Sudden onset of extreme pain in feet should be considered arthritic in origin, and search should be made for the primary focus. Pain in the heel of the so-called spur type is in reality of infectious origin arising from an inflammation of the deep calcaneal bursa.

New England Journal of Medicine, Boston

203: 1115-1180 (Dec. 4) 1930

*Anterior Poliomyelitis in Massachusetts, 1907-1929. F. C. Forsbeck and E. H. Luther, New York.—p. 1115.
*Early Diagnosis of Pregnancy: Zondek-Aschheim Test. B. Parvey, Boston.—p. 1121.
Patient's Reaction to Diagnosis of Tuberculosis. L. R. Williams and A. M. Hill, New York.—p. 1129.
Two New Clamps for Abdominal Panhysterectomy. L. E. Phaneuf, Boston.—p. 1131.
Useful Tongue Depressor. J. E. Quincy, Boston.—p. 1132.
Methods and Results of Diabetic Treatment. F. M. Allen, Morristown, N. J.—p. 1133.
Pyuria in Children. R. W. Robinson, Laconia, N. H.—p. 1139.
Prevention of Disease: Applications of Preventive Medicine. E. O. Otis, Exeter, N. H.—p. 1143.

Anterior Poliomyelitis in Massachusetts, 1907-1929.—Forsbeck and Luther state that in Massachusetts there has been little change in the case rate and mortality rate during the past twenty-three years. The relationship between mortality rate and case rate has not been marked. There is apparently a periodicity in the incidence of poliomyelitis and evidently the fatality rate is higher for years of high mortality. The seasonal distribution for poliomyelitis is similar to that for the U. S. registration area; the peak occurs in September. There is apparently no relationship between time of the peak and the size of the year's incidence. There is now a tendency for the peak to occur later in the year than formerly. The large number of cases studied shows a ratio of about seventy-seven females to every hundred males. This discrepancy is even greater during adolescence. There is a significant relationship between age of incidence and density of population, the cases occurring somewhat later in life in rural communities. However, there is apparently no significant difference in the case rate in rural and urban communities. Since 1918 there has been a striking change in the age distribution of poliomyelitis as a whole. The number of cases in the age group 0-4 has markedly decreased, while there has been a compensatory increase in the relative number of cases in the age group 5-14. The percentage of cases in adult life has remained quite constant.

Early Diagnosis of Pregnancy: Zondek-Aschheim Test.—Parvey has applied this Zondek-Aschheim test in the study of 191 patients in private practice. The results were in full concordance with the claim of Zondek and Aschheim. In every case the test checked with the clinical observations. In a few instances false reactions were obtained at first, but these were regularly proved, on repeated examinations, to be the results of error in technic. It has been shown that, in the latter months of pregnancy, morning urine must be used because of the diminishing concentration of the hormone at this period. The test becomes negative in abortion and ectopic gestation after separation of the fetus from the maternal circulation.

Radiology, St. Paul

16: 1-110 (Jan.) 1931

Recent Progress in Roentgen-Ray Standardization. L. S. Taylor, Washington, D. C.—p. 1.
Roentgenologic Appearance of Interlobar and Mediastinal Encapsulated Effusion in Thorax. E. Freedman, Cleveland.—p. 14.
Roentgenologic Aspect of Various Types of Colonic Diverticula. W. O. Upson and A. E. MacGregor, Battle Creek, Mich.—p. 30.
Rugged, Direct-Reading Iontoquantimeter of High Sensitivity. L. P. Delsasso and A. H. Warner, Los Angeles.—p. 39.
Roentgen Treatment of Menorrhagia of Menopause and Uterine Fibroids: 100 Cases. L. J. Carter, Brandon, Manit.—p. 44.
Deep Roentgen Treatment of Chronic Gonorrheal Infection in Female. C. M. Henry, Regina, Sask.—p. 47.
Effect of Roentgen Ray on Thyroid and Parathyroid Glands. O. M. Walters, B. J. Anson and A. C. Ivy, Chicago.—p. 52.
Tumor Involving Lymphoid Tissue. D. S. Childs, Syracuse, N. Y.—p. 59.
Intussusception. C. E. Weaver, Detroit.—p. 64.
Double Gallbladder, with Double Cystic Duct. R. Hayes, Longview, Wash.—p. 66.

Surgery, Gynecology and Obstetrics, Chicago

52: 1-128 (Jan.) 1931

Mixed Tumors of Kidney in Infancy and Childhood: Seventeen Cases. H. L. Kretschmer and W. G. Hibbs, Chicago.—p. 1.
*Effect of Cervical Paravertebral Anesthesia on Pulse Rate During Operations on Toxic Thyroid Gland. A. Brown, Omaha.—p. 25.
*Perivaginal Fascia in Nullipara. B. H. Goff, New York.—p. 32.
*Graves Constitution (Warthin). C. A. Hellwig, Wichita, Kan.—p. 43.
*Corpus Luteum of Pregnancy: Persistence of Pregnancy After Excision of Corpus Luteum in Early Weeks. M. Douglass, Cleveland.—p. 52.
*Hormone Test for Diagnosis of Early Pregnancy: One Hundred Cases. P. F. Schneider, Evanston.—p. 56.
Cause of Death in Liver Autolysis. E. Andrews and L. Hrdina, Chicago.—p. 61.
Juxtoretroperoneal Route in Operative Treatment of Fracture of Malleolus with Posterior Marginal Fragment. J. Gatellier, Paris.—p. 67.
Technic of Complete Breast Operation. E. I. Bartlett, San Francisco.—p. 71.
Management of Stone in Solitary Kidney and Ureter. C. P. Mathé, San Francisco.—p. 79.
*Treatment of Prepatellar Bursitis: Twenty-Seven Cases. L. Carp, New York.—p. 87.
Biliary Tract Visualization with Radiopaque Oils. R. H. Overholt, Philadelphia.—p. 92.
*Ovarian Pregnancy. R. R. Cranmer, Minneapolis.—p. 98.
Submucous Lipomata of Gastro-Intestinal Tract: Twenty-Eight Cases. M. W. Comfort, Rochester, Minn.—p. 101.

Effect of Cervical Paravertebral Anesthesia on Pulse Rate During Operations on Toxic Thyroid Gland.—Cervical paravertebral anesthesia, in addition to anesthetizing the upper cervical nerves, anesthetizes the upper cervical sympathetic ganglion and the upper part of the sympathetic cord. This anesthetization renders the superior and middle cervical cardiac nerves incapable of transmitting to the heart the increased accelerator impulses caused by the hypersensitization of these nerves, and the moderator impulses of the vagus reach the heart opposed only by the accelerator impulses through the lower cervical and upper thoracic cardiac branches of the sympathetic, which are usually not strong enough to overcome the vagus action completely and the pulse rate falls. Consequently, says Brown, during the operation of subtotal thyroidectomy for hyperthyroidism, cervical paravertebral anesthesia exerts a definite action toward slowing the rate of the pulse. Owing to the fact that under paravertebral anesthesia cardiac shock is less marked, the operative procedure does not diminish the patient's already weakened cardiac reserve and the postoperative course is smoother with relatively less cardiac reaction than with other types of anesthesia.

Perivaginal Fascia in Nullipara.—Goff states that in the normal nullipara there is no tissue in the walls of the vagina, urethra, bladder and rectum which can logically be termed fascia, if the classic histologic descriptions of the tissues are observed. There is no fascia between the anterior vaginal wall and the wall of the urethra. There is a thin layer of fascia of the areolar type between the anterior vaginal wall and the wall of the bladder. There is a similar layer of areolar fascia between the posterior vaginal wall and the wall of the rectum. The layer of areolar fascia that separates the anterior vaginal wall from the wall of the bladder (vesicovaginal fascia) and the layer of areolar fascia that separates the posterior vaginal wall from the wall of the rectum (retrovaginal fascia) unite at the sides of the vagina to form the perivaginal fascia, which is a part of the fascia endopelvina. The areolar character of the fascia that separates the vaginal wall from the walls of the bladder and rectum makes it impossible to dissect it as an individual layer, and as such to use it in vaginal plastic operative procedures. If used at all, it must be used in conjunction with the overlying wall of the vagina. There is no fascia other than the areolar perivaginal fascia available for use in the surgical correction of cystocele and rectocele. The successful surgical correction of cystocele, rectocele and urethrocele depends on the utilization of the tissues of the vaginal wall rather than on the use of the fragile areolar fascia that surrounds it. When using the term fascia in descriptions of vaginal plastic operations, it is important to stress the fact that the fascia referred to is not of the dense type, such as is the sheath of the rectus muscle, but that it is of the loosely arranged areolar type. It is apparent that many gynecologists have applied the term fascia to the muscular coat of the vaginal wall, which is situated just beneath the vaginal mucosa, because it somewhat resembles a layer of dense fascia in its gross appearance. It is obvious that such use of the term fascia is not in accord with classic histologic description of the tissues which constitute the vaginal wall. The abandonment of an inaccurate terminology, which is based on the gross appearance of the tissues, and the adoption of one based on the established histology of the tissues in and about the walls of the vagina, urethra, bladder and rectum, will lead to a clearer common understanding of the problems of cystocele, rectocele and urethrocele, and will facilitate the teaching of vaginal plastic surgery.

Graves Constitution.—Warthin's and Simpson's theory that in exophthalmic goiter the thyroid gland is not the chief pathogenic factor, but an incidental complication and sequela to a constitutional anomaly, is not confirmed by Hellwig's study. The most important histologic criterion of exophthalmic goiter, as far as the thyroid itself is concerned, is not the presence of hyperplastic lymph follicles throughout this gland. Of his cases of exophthalmic and toxic goiter only 66 per cent presented lymphoid tissue in the thyroid gland, and of the cases without clinical symptoms of thyreotoxicosis 38.5 per cent showed lymphocytic infiltration. In the typical cases of status thymicolymphaticus, the thyroid gland was free from lymphocytes. Lymphocytic infiltration of the thyroid is not a manifestation of an underlying constitutional anomaly but is a purely local response to hyperplasia and hypersecretion of the gland. Hellwig's observations are in complete agreement with the theory of Moebius that hypersecretion of the thyroid gland is the essential cause of exophthalmic goiter.

Corpus Luteum of Pregnancy.—The evidence offered by a case cited by Douglass allows him to state with some assurance that, in the human being, pregnancy is independent of the hormone supplied by the corpus luteum of pregnancy once its duration exceeds approximately four to six weeks.

Hormone Test for Diagnosis of Early Pregnancy.—In Schneider's experience in 100 cases, the Aschheim-Zondek test has shown its value effectively in the immediate differentiation of early pregnancy from such conditions as menstrual irregularity due to other causes, delayed return of menses following pregnancy, and pelvic masses simulating pregnancy. The rapid disappearance of the hormone after delivery, and the persistence of the reaction following incomplete abortion or death of the fetus, indicate that future investigation may prove the test of value in the diagnosis of retained decidual tissue following labor or incomplete abortion. The question of the diagnosis of ectopic pregnancy, hydatidiform mole, and chorio-epithelioma has not been encountered in this series.

Treatment of Prepatellar Bursitis.—Twenty-seven consecutive acute or chronic cases of prepatellar bursitis ("housemaid's knee") were studied by Carp to determine the end-results of conservative therapy. This consisted in aspiration of the fluid, injection of several cubic centimeters of half strength tincture of iodine into the sac, vigorous massage over the bursa, reinforced adhesive strapping over the sac with the knee in complete extension, and the application of a firm pressure bandage over the knee. The cases were preponderant in housewives. About 65 per cent of the patients gave a history of trauma. About one third of the patients complained of pain. Swelling of the bursa appeared either immediately after the trauma or after days, weeks or months. The character of the aspirated fluid depended on the length of time it took for accumulation. In the early cases it was bloody; in the later cases, amber or straw colored. Aerobic and anaerobic cultures in eleven cases were sterile. In a little more than half the cases, small amounts of fluid reaccumulated in an average time of ten days. Aspiration of this fluid was employed. A second injection of tincture of iodine in these cases was usually not necessary. An average follow-up of sixteen months in twenty-four out of the twenty-seven cases showed no symptoms or reappearance of bursal fluid. In twenty of the twenty-four follow-up cases, the average time for complete disappearance of the fluid was about three weeks.

Ovarian Pregnancy.—All of Spiegelberg's criteria were fulfilled in Cranmer's case. The tube on the affected side was intact, the sac occupied the position of the ovary, it was connected to the uterus by the utero-ovarian ligament, and ovarian tissue was found completely surrounding the sac.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

8: 41-80 (Jan.) 1931

*Blood Pressure in "Avertin" Anesthesia. W. P. Kennedy—p. 52.
*Influence of Ether on Toxicity of Procaine Hydrochloride. R. Perez-Cirera.—p. 67.

Blood Pressure in "Avertin" Anesthesia.—A series of 150 cases of "Avertin" anesthesia were observed by Kennedy, with especial reference to the changes on blood pressure. These were found to be greater than previously reported and greater than would commonly be considered safe. At the same time no untoward results were observed, and similar changes are reported in young men exposed to very high external temperatures. From the experiences of the series the conclusion is drawn that "Avertin" provides an advance in anesthetic practice of prime importance.

Influence of Ether on Toxicity of Procaine Hydrochloride.—On the basis of experiments on animals, Perez-Cirera states that no alteration in the toxicity of procaine hydrochloride administered intravenously is found if ether is given afterward. A large increase in its toxicity is found if the procaine is administered intravenously after etherization. The increase in toxicity falls rapidly with increase in the time between etherization and administration of procaine. The average fatal dose without ether in mice is 0.09 Gm. per kilogram. The average fatal dose with ether is 0.025 Gm. The lethal dose for cats, with ether, is about 0.04 Gm. The lethal dose for cats, without ether, is about 0.05 Gm. In cats, intravenous injection of procaine causes a marked effect on respiration, which is coincident with a fall in blood pressure. It would appear that ether does not cause any change on the seat of action of procaine.

British Journal of Children's Diseases, London

27: 245-332 (Oct.-Dec.) 1930

*Postvaccinal Encephalitis in Infancy. T. F. M. Scott.—p. 245.
*One Hundred Cases of Failure of Breast Feeding in First Month. H. W. Pooler.—p. 269.
*Specificity of Hemolytic Streptococcus Associated with Scarlet Fever. T. Toyoda, J. Moriwake, Y. Futagi and S. Hoshizaki.—p. 282.
*Sublingual Mumps with Edema of Tongue. E. H. R. Harries and E. C. Benn.—p. 293.
Pyonephrosis as Complication of Typhoid. J. Wright.—p. 296.

Postvaccinal Encephalitis in Infancy.—A new case of postvaccinal encephalitis in infancy is recorded and twenty-one other cases are quoted by Scott. These cases are shown to fall into five clinical groups, whose symptomatology is described. The cerebrospinal fluid is found to be normal in almost every case. There was no particular day after vaccination on which the bulk of cases occurred. The postmortem examination of one case and the typical pathologic picture are described. The differential diagnosis is discussed. The prognosis is shown to depend considerably on the clinical form of the disease. The extreme rarity of this disease in infancy as compared to other ages is illustrated by statistics. The etiology in general is discussed. The relative immunity in infants is discussed and a suggestion is made that family history may be of value in foreseeing the liability of the infant to the disease.

Failure of Breast Feeding in First Month.—The conclusion Pooler draws from this examination is that the real deciding issue in the whole of these cases was the return of the mother to her domestic duties and worries. There were other conditions which might have caused some trouble, but he regards them as auxiliary only in bringing about the early weaning in this group. To some extent he has had to revise the views he expressed in 1928. A longer rest in bed was not effective in three cases. The effects of poor feeding of the mother and the disturbance of the baby's nervous system do not loom large in the analysis. Too frequent feeds seem to be sometimes a result rather than a cause of failure. He does not, however, ignore their influence while stressing the dominant importance of the early return of the mother to her domestic duties.

Hemolytic Streptococcus Associated with Scarlet Fever.—From the study of ninety-seven strains of these organisms, Toyoda et al. reach the conclusion that neither morphologically, biologically nor serologically can the scarlet fever streptococci be regarded as possessing a specificity that distinguishes them from other hemolytic streptococci.

Mumps with Edema of Tongue.—Harries and Benn report two cases in which solitary sublingual mumps produced a high degree of edema of the tongue. They have not seen the condition before nor have they been able to trace any previously recorded examples in the literature. The tongue of one of the patients was noted to be greatly swollen, protruding from and filling the mouth. The appearance of the tongue was otherwise normal; it was not inflamed but simply much enlarged. When the tongue was raised, the floor of the mouth was seen to be edematous. Both sublingual salivary glands were swollen and tender. There was a moderate amount of enlargement and tenderness of the submental lymph nodes. By exercising considerable pressure on the dorsum of the tongue, it was found to be possible to obtain a momentary view of the palate and fauces. Nothing abnormal was seen. Examination, equally difficult, of the buccal mucosa revealed well marked bilateral papillitis of the orifice of Stensen's duct. Similar changes were noted in the other patient.

British Journal of Radiology, London

4: 1-48 (Jan.) 1931

Training in Radiography. J. D. White.—p. 22.
Unusual Case of Bronchiectasis. J. V. Sparks.—p. 30.
New Kind of Rays. W. C. Röntgen.—p. 32.

British Medical Journal, London

1: 81-124 (Jan. 17) 1931

Zoster, Varicella and Encephalitis. W. R. Brain.—p. 81.
*Treatment of Pernicious Anemia with Hog's Stomach: 108 Cases. J. F. Wilkinson.—p. 85.
Removal of Adenoids: Simplified Technic. O. Popper.—p. 92.
Choice of Blood Sugar Method for Clinical Work. F. K. Herbert and M. C. Bourne.—p. 94.

Treatment of Pernicious Anemia with Hog's Stomach.—Wilkinson states that relapses did not occur in any of 108 patients with pernicious anemia treated with fresh and desiccated preparations of hog's stomach tissues. All the patients have done well. This treatment has given highly satisfactory results, undoubtedly better than with liver, while the relative effective dose is less than the dose of liver. More than 92 per cent of the patients treated with hog's stomach are perfectly well and the majority are doing their full time work. A further 6 per cent are much improved but still suffer from varying degrees of nervous impairment. Hog's stomach therapy is superior to liver diet in the speed of remission of the condition, the erythrocytes and hemoglobin increasing 157 per cent and 94 per cent, respectively, compared with 90 per cent and 77 per cent, respectively, with liver under comparable conditions. Clinically, the immediate results are similar to those obtained with liver. They are more prompt and the normal health is reached more quickly, work is resumed sooner, and all the gastro-intestinal symptoms appear to be relieved. This is not always the case with liver treatment, hydrochloric acid and pepsin being frequently required in addition to relieve the indigestion, flatulence and occasional sore tongue. Achylia gastric persists despite the treatment. Hydrochloric acid and pepsin do not appear to be necessary for the relief of symptoms with this form of treatment. There is a minimum dose of hog's stomach to maintain the normal health of each patient. Regular blood counts are essential for the control of this dose. Fresh hog's stomach can be taken in adequate doses for a few days every three to four weeks with a maintenance of normal health. Several cases with early posterolateral involvement of the spinal cord have shown remarkable improvement, and paresthesias of the hands and feet (without alteration of reflexes) have been almost completely cured in nearly every case. These have always been the symptoms most resistant to treatment.

Edinburgh Medical Journal

38: 1-72 (Jan.) 1931

*Local Vascular Changes in Splenic Anemia. J. McMichael.—p. 1.
*Care of Surgical Diabetic. A. R. Gilchrist.—p. 30.
*Dehydration in Intestinal Obstruction. G. Miller.—p. 47.

Local Vascular Changes in Splenic Anemia.—Sixteen spleens from cases of splenic anemia were examined by McMichael. These were principally cases of hepatolienal

fibrosis, but spleens from Egyptian splenomegaly, tuberculosis of the spleen, hemolytic jaundice and some other unclassified types also were examined. In addition, some experimental work has been carried out with regard to obstruction of the splenic vein and the organization of hemorrhages in the spleen. He found that hyaline degeneration of the pulp arteries is a common occurrence after the age of 10 years. It is probably related to involution changes in the lymphoid tissue in the spleen and has no pathologic significance. Endophlebitis of the splenic vein is difficult to detect in its early stages. It is probably determined by raised portal blood pressure, calcification and thrombosis being secondary phenomena. Thrombosis of the splenic vein is not a direct cause of the splenic anemia complex. The siderotic nodules in the spleen are the end-result of periarterial hemorrhages which take origin from the ellipsoidal capillaries. One important factor in the causation of these hemorrhages is congestion of the spleen. This may be determined by arterial hyperemia or by raised venous pressure. It is probable that the periarterial fibrosis of Banti has its origin in the same perivascular hemorrhages. In the cases of hepatolienal fibrosis there was a constant relationship between siderotic nodules and hematemesis. It seems highly probable that both the hematemesis and the siderotic nodules in these cases result from increased portal blood pressure.

Care of Surgical Diabetic Patient.—The nature of the metabolism of the diabetic patient is described by Gilchrist in order to show how acidosis is produced. An improper diet, lack of food, anesthesia and infection all predispose to the production of acidosis. The appropriate treatment and prevention of this condition is outlined. Emphasis is placed on the important part played by sepsis in antagonizing the action of insulin, in precipitating acidosis and in being a frequent accompaniment of diabetic coma. The use of insulin and dietary measures to combat the production and excretion of ketone bodies are described in detail. Postoperative diets that have been found useful in a number of conditions are given. The response of a case of diabetic gangrene to dietetic and insulin treatment is recorded.

Dehydration in Intestinal Obstruction.—Experiments have been carried out by Miller to show the difference in the fluid content of the organs of normal animals and of those dying from intestinal obstruction. On the basis of his observations he asserts that, in high simple obstruction in dogs, death is caused by loss of intestinal secretion causing dehydration and loss of sodium and chloride ions. Only the blood plasma and interstitial fluid are lost. The intracellular fluid is maintained by an ionic concentration consisting mainly of phosphoric acid and potassium. These are not lost in the gastro-intestinal secretion and so dehydration does not impair the intracellular fluid.

Lancet, London

1: 61-114 (Jan. 10) 1931

Celiac Disease. L. G. Parsons.—p. 61.
*Clinical Conditions Associated with Achlorhydria. J. F. Wilkinson and T. H. Oliver.—p. 66.
Graphic Blood Pressure Records. J. F. H. Dally.—p. 71.
Nembutal as Basal Hypnotic in General Anesthesia. I. W. Magill.—p. 74.

Clinical Conditions Associated with Achlorhydria.—Wilkinson and Oliver assert that they have evidence that an association exists between a gastric secretory dysfunction and certain clinical conditions (excluding such well known diseases as pernicious anemia). A hundred cases have been examined and they fall naturally into five groups. Group 1 is a definite clinical entity characterized by gastro-intestinal disturbances and recurrent diarrhea; flatulent dyspepsia and neurasthenia are prominent symptoms. The clinical picture is sufficiently characteristic to allow the diagnosis of achlorhydria to be made with considerable certainty. There were fifty-three cases. Twenty-five showed achylia gastrica and eighteen hypo-acidity (eight with deficient peptic activity) on examination by fractional test meal. Group 2 comprises twenty-five cases in which the prominent feature was a sore tongue or an ulcerative stomatitis. The gastro-intestinal disturbances encountered in group 1 may or may not be present. Fractional gastric analysis showed that nine of these patients had achylia, six hypochlorhydria (only one having a normal peptic activity), seven with a normal acidity (four with reduced peptic activity) and three with hyperacidity. In group 3, five patients complained of skin lesions in addition to the gastro-intestinal or glossitic symptoms, while one other had an urticaria and angioneurotic edema. Achylia was present in four, hypo-acidity in one and hyperacidity in one of the cases. In group 4, five cases of rheumatoid arthritis were examined; one, associated with diarrhea, presented hypo-acidity, while in four with histories of glossitis, three presented achylia and one hypo-acidity. Group 5 comprised ten cases of debility with degrees of secondary anemia, for which no cause could be found. Four patients had achylia and four had hypochlorhydria.

Annales de Médecine, Paris

28: 201-396 (Oct.) 1930

*Semeiology of Thoracic Pain: Pain Provoked by Stomach Syndromes. E. Rist.—p. 201.
Anatomoclinical Study of Primary Cancer of Lung: Case. E. Rist and J. Rolland.—p. 231.
Morphologic Study of Allergic Field in Pulmonary Tuberculosis. E. Rist, Doubrow and R. Froment.—p. 310.
*Simultaneous Bilateral Pneumothorax. E. Coulaud.—p. 320.
Nontuberculous Tracheal Hemorrhages. A. Soulas.—p. 382.

Semeiology of Thoracic Pain: Pain Provoked by Stomach Syndromes.—After reviewing the literature on the subject, Rist cites personal clinical observations that show the extreme importance of a correct interpretation of the existence of thoracic pain. When such pain is the only symptom, it rarely indicates disturbances in the intrathoracic respiratory organs; on the contrary, it is rather a warning to discard such an interpretation, for the thoracic pain that accompanies diseases of the thoracic organs is usually merely one of several more specific symptoms. The monosymptomatic thoracic pain in question is usually a referred pain produced by lesions in other parts of the body, particularly the stomach and duodenum. Among eighty-seven cases of thoracic pain of gastric origin observed during one year, seventy-one times the thoracic pain was localized on the left side. The explanation for this phenomenon is not certain; however, it possesses a certain pathognomonic value in determining the gastric origin of the pain in such cases. The cases observed by the author all concerned patients who had come to the clinic because of a false diagnosis of tuberculosis suggested by the thoracic localization of the pain. In fifty-one of the eighty-seven cases the cause was gastric ptosis, the pain being usually localized in the left interscapulovertebral space corresponding to the fifth to the eighth thoracic segments, though it sometimes occurs also at the base of the neck and above the infraspinous fossa toward the anterior portion of the trapezius, the pain being transmitted to the third, fourth and fifth cervical segments by the phrenic nerve. Another important cause of thoracic pain was found to be gaseous distention of the stomach from aerophagy, often caused by swallowing movements made to free the rhinopharynx of pathologic secretions. The pain in such cases is observed in the same region as that produced by gastric ptosis. A third gastric disturbance in which the pain is referred to the thoracic region is medicamental gastritis. This was especially noticeable in the cases under discussion since in all of them the presence of tuberculosis had been suspected and drugs had often been prescribed that are notably harmful to the stomach, such as creosote, tincture of iodine and various proprietary preparations. The author feels that the facts presented here are sufficient to show how often thoracic pain indicates disturbances in the abdominal organs, especially gastric lesions when the pain is on the left side.

Simultaneous Bilateral Pneumothorax.—Coulaud gives the results in 116 cases in which he used simultaneous bilateral pneumothorax. In 67 cases a unilateral pneumothorax was already present and the second pneumothorax was established after the tuberculous lesions had become bilateral. In 49 cases the double pneumothorax was established from the beginning. Of the 116 patients, 67 died and 49 either were living at the time of writing or had died of a disease other than tuberculosis; 39 were definitely cured. Death was due in 4 cases to accidental causes (cardiac disturbances, pneumonia and traumatic perforation) before the pneumothorax treatment was completed. Intestinal tuberculosis was responsible for 14 deaths. The author points out, however, that this was an additional extrapulmonary localization of the tuberculous condition rather

than an unfavorable result of the pneumothorax. In 49 cases death was the result of the progression of the pulmonary tuberculosis in the collapsed lungs, with or without spontaneous pleuropulmonary perforations or severe hemoptysis. In 28 of the 49 cases the collapse itself was found to be inadequate. Since the collapse was good in all the cases in which the patients were cured, it seems logical to conclude that a poor collapse means failure of the treatment. The twenty-one cases in which death occurred from progressive pulmonary lesions in spite of a good collapse present a more serious problem. However, all the 116 cases were severe ones, most of them of long standing, and there must necessarily have been a number of patients without sufficient natural resistance to permit of a cure even with the aid of the therapeutic pneumothorax. From his observations the author believes that a bilateral pneumothorax, when a unilateral pneumothorax is already established, is indicated beyond a doubt in the presence of cavities in both lungs. Definite contraindications to such treatment are the existence of an imperfect collapse on the side of the first pneumothorax, early bilateral nodular tuberculosis and the existence of a serious extrapulmonary tuberculous localization. Establishment of a simultaneous bilateral pneumothorax at the beginning is indicated in cases of bilateral cavity formation and of involvement of both lungs. It is contraindicated by extensive nodular tuberculosis predominating on one side and by extensive caseous tuberculosis. The author describes the method of treatment used and the complications encountered.

28: 397-500 (Nov.) 1930

*Spontaneous Cure of Tuberculous Pulmonary Caverns. H. Wohlers.—p. 397.
Pulmonary Syndromes of Physiologic Sections of Spinal Cord. L. Cornil, A. Hamant and M. Mosinger.—p. 453.
Congenital Hyperthermia. J. Trosier.—p. 480.
Hypotensive Action of Certain Organic Extracts. R. Fontaine and A. Jung.—p. 485.

Spontaneous Cure of Tuberculous Pulmonary Caverns.—Wohlers points out that the possibility of spontaneous cure of tuberculous pulmonary caverns depends largely on the mechanical conditions governing their evolution. From this standpoint he differentiates the following three classes of caverns as a guide to prognosis and treatment: 1. Caverns of the first class with soft walls, of recent formation, localized in the middle portion of the lung and surrounded by a pulmonary parenchyma only slightly infiltrated, indicate an excellent prognosis and are usually cured spontaneously and quickly by a simple rest cure. A therapeutic pneumothorax is rarely justified in such cases. 2. Caverns of the second class, the walls of which offer little true resistance, of recent formation, localized at the apex or near the hilus, or surrounded by abundant infiltrations, present a less favorable prognosis. The author recommends that a rest cure be tried for at least two or three months. If spontaneous cure does not result, a pneumothorax may then be established. 3. Caverns of the third class with sclerosed walls, formed of a semicartilaginous shell in extreme cases, or of an unfavorable localization at the base of the lung, or of unusual size, generally necessitate surgical intervention according to the exigencies of the particular conditions. The author cites twenty-nine of the many cases of pulmonary caverns on which his conclusions are based.

Presse Médicale, Paris

38: 1529-1552 (Nov. 12) 1930

Hormonal Duality of Glycoregulatory Internal Secretion of Pancreas. D. Santenoise.—p. 1529.
*Pancreatic Fistula with Reingestion of Pancreatic Fluid and Pancreaticogastrostomy. J. Cathala and J. Sénèque.—p. 1534.
Antivirus Therapy in Gonococcal Infections. A. Bass.—p. 1537.

Pancreatic Fistula with Reingestion of Pancreatic Fluid and Pancreaticogastrostomy.—Cathala and Sénèque report a case in which an attack of acute pancreatitis was followed by an adventitious cyst with intracystic hemorrhage. The cyst was punctured and about 4 liters of hemorrhagic fluid was withdrawn; it was then affixed to the abdominal wall by marsupialization. The fistula thus established was well tolerated by the patient for a few days. However, the discharge of pancreatic juice persisted and after a time the patient lost weight and began to grow markedly weaker. Injections of atropine and other medical treatment were of no avail. The fistula did not heal. A pancreaticogastrostomy seemed advisable, but because of the general condition of the patient there was considerable doubt as to the safety of a serious operation requiring general anesthesia. In a day or two the fistula closed and the patient complained of severe pain. Catheterization of the fistula night and morning relieved the pain; the average amount of fluid removed was about 250 cc. For almost two weeks the patient drank each day the pancreatic fluid removed from the fistula. The effects were striking: increase in weight, disappearance of vomiting and digestive disturbances, and general increase in physical vigor. A pancreaticogastrostomy was then made with excellent results. The authors feel that the reingestion of pancreatic fluid should be practiced from the first establishment of fistulas of this nature in order to avoid the serious general symptoms that developed in this case. If after four or five months the fistula does not heal spontaneously the patient is then in a proper condition to support an operation.

38: 1625-1640 (Nov. 29) 1930

*Absence of Bacteriolytic Properties in Pleural Fluids Discharged in Course of Artificial Pneumothorax. F. Bezançon and E. Buc.—p. 1625.
Case of Pyopneumothorax Secondary to Hydatid Cyst of Lung. P. Hillemand, P. Chêne and F. Soules.—p. 1626.
Abdominolumbar Transfixion in Acute Pancreatitis. F. Ody.—p. 1628.
Antipneumococcal Serotherapy. R. Mignot.—p. 1630.

Absence of Bacteriolytic Properties in Pleural Fluids Discharged in Course of Artificial Pneumothorax.—Bezançon and Buc performed a series of experiments to determine whether bacteriolytic properties exist in the fluids discharged in the course of tuberculous pleurisy or in the discharges from artificial pneumothorax. Examination of the discharges from artificial pneumothorax revealed the presence of tubercle bacilli in twenty-two cases out of twenty-four. Inoculation of guinea-pigs with these fluids produced tuberculosis in every case. After about two months, however, the virulence of the bacteria was diminished, and it finally disappeared entirely. The disappearance of the virulence was not due, however, to the presence of bacteriolytic properties in the fluids, since it was shown experimentally that an emulsion of tubercle bacilli in physiologic solution of sodium chloride, kept in a water bath at a temperature of 37 C., also lost its virulence in about the same length of time. The seemingly curative effect of pleural discharge on tuberculous lesions must, therefore, be due to some factor other than the presence of bacteriolytic powers in the fluids themselves.

Revue Médicale de la Suisse Romande, Lausanne

50: 753-816 (Nov. 25) 1930

Antidiphtheria Vaccination in Zones of Infection. J. Pelet.—p. 753.
*Influence of Heredity on Tuberculosis. J. Stephani-Cherbuliez.—p. 761.
Sweetened Condensed Milk and Dental Caries. J. Taillens.—p. 770.
Pyrethrum and Pyrethrines as Anthelmintics. B. Wiki.—p. 773.
Deep Electronization by Monopolar High Frequency Apparatus. P. Rœthlisberger.—p. 777.
Three Cases of Undulant Fever. J. Knecht.—p. 781.
Treatment of First Stages of Poliomyelitis. P. Gautier.—p. 793.

Influence of Heredity on Tuberculosis.—From personal observation of 1,017 patients with tuberculosis, Stephani-Cherbuliez ascertained that 823 of the patients were descended from healthy parents, while only 194 were of tuberculous parentage. The disease as a rule appeared earlier in the descendants of tuberculous parents. Among the descendants of healthy parents the severe chronic forms or fatal forms of tuberculosis predominated, while among the descendants of tuberculous parents the benign forms were by far the most numerous. The author's results confirm those of previous investigations, a number of which he cites.

Schweizerische medizinische Wochenschrift, Basel

60: 1121-1144 (Nov. 29) 1930

*Injuries of Eyes Caused by Radiant Energy. A. Vogt.—p. 1121.
Roentgen Studies of Gastric Mucous Membrane. H. H. Berg.—p. 1126.
Etiology and Clinical Aspects of Diabetes Mellitus Juvenilis. T. Baumann.—p. 1129.
Syphilis with Resistance to Arsphenamine, Mercury and Bismuth. J. Wyler.—p. 1133.

Injuries of Eyes Caused by Radiant Energy.—Vogt directs attention to the fact that sunlight as well as artificial light under certain conditions may cause temporary or permanent injuries of the eyes. It has long been known that looking

into the sun, which is often done during solar eclipses, is followed by temporary or permanent scotoma. The author found that this injury is mainly due to an injury of the macula lutea by burning of the pigment epithelium and the neuro-epithelium by the infra-red rays. Another injury caused by sunlight is the snow blindness developing in the high mountains. This is caused by ultraviolet radiation, which injures especially the cornea and the conjunctiva. Glass blowers' cataract, the pathogenesis of which was not entirely clear until recently, is caused by infra-red radiation. In regard to roentgen injuries of the eye it is stated that they become noticeable either shortly after the irradiation or after a longer interval. The author advises against the treatment of blepharitis with small doses of roentgen rays, because this disturbance usually yields to medicinal therapy, and although roentgenologists assert that small doses of roentgen rays are not injurious to the eye, the late effects on the lens cannot be definitely denied. Injury of the eye may also be caused by radium rays. It is similar to that caused by roentgen rays.

Policlinico, Rome

37: 521-576 (Nov. 15) 1930. Surgical Section

*One Hundred Cases of Perforation of Gastric or Duodenal Ulcer. G. Barbera.—p. 521.
Obturator Hernia. G. Canavero.—p. 541.
Renal Echinococcus: Case. L. Mollo.—p. 557.
Mucocele and Pseudomyxoma of Peritoneum of Appendicular Origin. L. Sussi.—p. 568.

One Hundred Cases of Perforation of Gastric or Duodenal Ulcer.—Barbera describes 100 cases of perforated gastric and duodenal ulcers. In the majority of cases the classic syndrome of acute gastric perforation, the excruciating pain, especially in the epigastric region, and the marked rigidity of the whole abdominal wall, was manifested. Less frequently the secondary signs were noted. In 82 cases of the 100 the diagnosis was accurate, and direct intervention was applied to the stomach. In eleven cases a diagnosis of appendicitis was found wrong at operation. It became necessary to continue the operation higher up when it was found that a gastric lesion was involved. In sixty-nine cases the operation was performed under general anesthesia (in sixty-three cases ether was employed, and in six cases chloroform). In seventeen cases local anesthesia with procaine hydrochloride and morphine was used, and in thirteen cases spinal anesthesia with procaine hydrochloride or tutocain. Xipho-umbilical laparotomy is the preferred form, as it allows the exploration of the stomach and the duodenum and permits the easy execution of gastro-enterostomy. The right transrectal operation is advantageous when the diagnosis "duodenal ulcer" is assured. There were forty-four deaths and fifty-six recoveries. Of the sixty cases in which the operation was performed within twelve hours, only twelve, or 20 per cent, resulted fatally. Of the thirty-five cases in which it was performed between the twelfth and the forty-eighth hour, or beyond, thirty-one resulted fatally, or 88.7 per cent. All statistics agree in making twelve hours the dead-line for a favorable prognosis. Of the three quinquenniums, the mortality was 56.25 per cent in the first, 48.2 per cent in the second and 38.6 per cent in the third.

Rivista di Clinica Pediatrica, Florence

28: 937-1080 (Nov.) 1930

Experimental Histologic Contributions in Experimental Syndromes Induced by Deficiency of Vitamins D and A in Young Animals. V. Nava.—p. 937.
*Electrocardiogram of Healthy Child. G. Halfer.—p. 959.
*Epidemiologic Notes on Acute Anterior Poliomyelitis in Genoa in 1929. G. Magliano.—p. 966.
*Still's Disease and Chronic Polyarthritis in Children. A. Gentili.—p. 1017.
*Prophylaxis of Measles with Normal Horse Serum. P. Mazziotti.—p. 1049.

Electrocardiogram of Healthy Child.—Halfer studied the electrocardiographic records of the healthy child in ten boys and girls in the consultation center of the Clinica pediatrica. The youngest was 15 months of age and the oldest 9 years. The records were all taken with the same apparatus (the Siemens in the Clinica medica). From his examination of the records, Halfer concludes that the electrocardiogram of the healthy child is widely differentiated. It presents a progressive increase of all the positive waves. The P-R interval after the third year of life becomes normal. The deflection R increases steadily until it attains the height observed in the adult. Deflection S is not very deep. Deflection T is variable. In half the cases, and especially in children less than 3 years of age, there was right ventricular predominance; in the others there was an equilibrium between the two ventricles.

Epidemiologic Notes on Acute Anterior Poliomyelitis in Genoa.—Magliano, after reviewing rapidly the bibliography of infantile paralysis with regard to the pathologic anatomy, etiology, clinical aspects and epidemiology, describes in a general way 134 cases of poliomyelitis diagnosed in the commune of Genoa. He then discusses at length the epidemiology and contagiousness of the disease from various points of view, and reaches the following conclusions: Early diagnosis is difficult. It is difficult to determine exactly the period of incubation. He regards the phenomenon of a "convulsive attack" as a prognostic symptom of grave paralysis or fatal outcome. Slight importance is to be attributed to the economic factor and to the state of nutrition of the patients in relation to the morbidity. The author accepts what has been brought out by other authors with regard to the greater incidence of the disease among males, and in persons of a certain age and at certain seasons. He does not assign much importance, as regards transmission of the disease, to animals in general, to blood parasites or to infected objects. Contagion is easy, but the disease is not contracted readily. Great importance is attached to carriers. Absence of multiple contagions in the same family, even in the presence of proved contacts, is emphasized. He admits that the virus is introduced through the naso-buccal mucosa or through the digestive tract and accepts the existence of an organic predisposition to the disease.

Still's Disease and Chronic Polyarthritis in Children.—Gentili, after general remarks on chronic polyarthritis in children, which still constitutes, he admits, an obscure chapter in infantile diseases, describes four cases of Still's disease. This is a peculiar type of chronic polyarthritis in children, especially rare in his region, which is always accompanied by enlargement of the spleen, a generalized hypertrophy of the lymph nodes and often hepatomegaly. All these symptoms were evident in the four children under discussion. In regard to autonomy of this disease type, which is often discussed, he holds that Still's disease, from the nature of its peculiar clinical character, should be differentiated from the ordinary picture of chronic infantile polyarthritis.

Prophylaxis of Measles with Normal Horse Serum.—Mazziotti endeavored to ascertain whether the prophylaxis of measles such as was obtained by Pontano in healthy children by the use of normal horse serum could be secured likewise in sick hospitalized children, with a view to arresting a grave hospital outbreak. Two experiments were carried on simultaneously in 1929 in the pediatric clinic and in the "Bambin Gesu" Hospital in Rome, with good results (in the first experiment, about two thirds of the children were exempt while one third exhibited prolonged incubation; in the second experiment twenty-four out of thirty-six were exempt, while eight presented prolonged incubation). The partial success attained would have been, in all probability, total, if in place of the small doses employed (from 5 to 7 cc., in agreement with Pontano's suggestions), stronger doses had been administered. The author advises further researches in order that the problem of prophylaxis in measles, which is so important for children, may be solved.

Semana Médica, Buenos Aires

37: 1393-1456 (Nov. 6) 1930

Treatment of Chronic Obstruction of Auditory Tube. L. Samengo and P. L. Errecart.—p. 1393.
*Cystic Embryoma of Bladder: Case. E. Castaño.—p. 1400.
*Intravenous Quinidine Therapy in Paroxysmal Tachycardia. T. Padilla and P. Cossio, Jr.—p. 1402.
Surgical Treatment of Y Shaped Fractures of Lower End of Humerus. T. Gioia.—p. 1407.
Spondylolisthesis Treated with Osteoperiosteal Graft. P. H. Garavano.—p. 1409.
Polycystic Disease of Kidneys in Twin Brothers. I. M. Hernández, J. Damianovich and R. J. C. Annone.—p. 1430.
Determination of Purine Content of Meat Extract by Krüger-Smid Method. A. Escudero and G. Waisman.—p. 1436.
Determination of Globular Resistance in Toxicology. R. E. Carratalá.—p. 1438.

Reticulo-Endothelioma of Tonsil: Metastasis in Lung. L. Zeno, O. Cames and J. M. Cid.—p. 1442.
Simplification of Technic of Halban's Operation for Genital Prolapse. A. H. Molfino.—p. 1446.
Malignant Degeneration of Cervix as Late Result of Subtotal Abdominal Hysterectomy. A. Chueco.—p. 1448.

Cystic Embryoma of Bladder.—Castaño says that his case of parasitic teratoma or cystic embryoma of the bladder is the second one reported in the literature. He reviews the genesis of embryonic tumors. His patient, aged 42, while in normal condition, complained occasionally of intermittent disturbances of the bladder associated with hematuria and pain in the perineum. The disturbances followed excessive walking. After one of the attacks, the patient, while voiding, felt the sensation of having eliminated something. She observed the urine and found an object resembling a small bundle of straw, which proved to be calcified hairs. Roentgen examination showed a pedicled tumor of the bladder. An operation was performed in which the tumor was successfully removed. The anatomicopathologic study of the tumor proved that it consisted of fibrous tissue, bones, and a papillomatous surface of skin with sebaceous glands, in which hairs (like those expelled) were lodged. The lining epithelium of the tumor was ulcerated and the subjacent tissue was infiltrated with lymphocytes and polymorphonuclear leukocytes. There were also pieces of cartilage enclosed in perichondrium, and dermis. The author says that in his case the tumor should not be mistaken for a dermoid cyst, in which bones or teeth are enclosed in the cystic cavity. In his case, on the contrary, a layer of skin covered an osteocartilaginous skeleton, proving that it was a parasite teratoma or cystic embryoma.

Intravenous Quinidine Therapy in Paroxysmal Tachycardia.—Padilla and Cossio report two cases of supraventricular paroxysmal tachycardia, one of an auricular and the other of an infranodal origin, in which the intravenous administration of quinidine sulphate suddenly arrested the attacks. The authors conclude that intravenous quinidine therapy is indicated because of its harmlessness in every attack of paroxysmal tachycardia that cannot be arrested by the methods of treatment in common use. The following precautions should be observed in the administration of quinidine: The quinidine sulphate used should be chemically pure with an impurity no higher than 0.5 per cent. The doses should be 0.5 Gm., dissolved in 10 cc. of physiologic solution of sodium chloride and as perfectly sterilized as is necessary for intravenous administration. The injection should be given slowly, the patient being placed in a horizontal position. If the dose mentioned does not arrest the attack, a larger dose may be administered, never exceeding a maximum of 0.15 Gm. for each 10 Kg. of body weight. When the intravenous injection of quinidine causes a cessation of the attack, the drug should be given orally in the usual doses for some time longer, to secure lasting results.

Deutsches Archiv für klinische Medizin, Leipzig

169: 1-128 (Nov.) 1930

Excretion of Sodium Bicarbonate in Urine in Diabetes Insipidus. F. Mainzer.—p. 1.
*Fibrinopenia in Adult. R. Jürgens and H. Trautwein.—p. 28.
*Infarct of Myocardium: Electrocardiographic Diagnosis. Grotel.—p. 44.
*Allergy in Relation to Eosinophilia. A. Peipers.—p. 65.
*Tuberculous Meningitis: Glycyltryptophan Test in Cerebrospinal Fluid. J. Ammerschläger.—p. 75.
*Concurrence of Cirrhosis of Liver and Gynecomastia. F. Paula.—p. 83.
Renal Insufficiency Caused by Oxalic Acid Poisoning. F. Koch.—p. 100.

Fibrinopenia in Adult.—Jürgens and Trautwein review the three cases of hemorrhagic diathesis with complete or almost complete disappearance of the fibrinogen from the blood reported in the literature and to these add the clinical history of a fourth case, the first one ever observed in an adult. Examination of the blood revealed a great deficiency of fibrinogen but a normal amount of all the other components of coagulation. Postmortem examination disclosed an almost completely isolated, extensive bone carcinosis with fibrous transformation of the bone marrow. The primary growth was a carcinoma of the prostate. The macroscopic and particularly the microscopic changes indicated that the bone marrow plays a part in the formation of fibrinogen.

Infarct of Myocardium: Electrocardiographic Diagnosis.—Grotel gives the characteristic changes in the electrocardiogram in infarct of the myocardium thus: 1. During the first few days (from one to ten) following complete obstruction of a coronary artery there is an elevation of the R(S)T interval above the iso-electric line or a dropping below it with a positive and high T deflection. 2. After from one to ten days there appears a negative deep pointed T deflection preceded by an R(S)T interval with its convexity directed upward; this is accompanied by a decrease in the size of the R deflection (in some cases by an increase in the size of the Q deflection). 3. The elevation of the R(S)T interval above the iso-electric line in leads I and II is usually accompanied by its descent below the iso-electric line in leads II and III. Usually there appears besides the negative T deflection in leads I and II a positive T deflection in leads II and III. In rare cases there is observed a displacement of the R(S)T interval above or below the iso-electric line and the negative T deflection simultaneously in leads II and III. The displacement of the R(S)T interval and the changes in the T deflection in lead II usually repeat the character of the changes either in lead I or in lead III. In angina pectoris without infarct of the myocardium, specific changes in the electrocardiogram were not observed. Therefore electrocardiographic examination is of great importance in the differential diagnosis between attacks of angina pectoris caused by an infarct and ordinary attacks of angina pectoris without infarct.

Allergy in Relation to Eosinophilia.—Peipers states that in exogenic allergic asthma with positive cutireaction eosinophilia is not always present. It is only one of the clinical manifestations of allergy, and frequently of the predisposition to attacks of asthma. On the other hand, the cutireaction is positive in many clinically latent cases. In persons with a negative cutireaction the presence of eosinophilia indicates that a further search for an allergic etiology should be made with other methods because even in definite allergic diseases that valuable diagnostic symptom may be absent. With the technic used (smear method) an increase in the number of eosinophil cells in the positively reacting skin could not be demonstrated.

Tuberculous Meningitis: Glycyltryptophan Test in Cerebrospinal Fluid.—From observations in fourteen cases of meningitis, Ammerschläger concludes that tuberculous meningitis cannot be differentiated from other kinds of meningeal inflammation by means of the glycyltryptophan test with cerebrospinal fluid. In basal meningitis the test is definitely positive, but it is also positive in nontuberculous meningitis if it is accompanied by a cell count of at least 500. In such nontuberculous conditions with an increase in the ferment content of the cerebrospinal fluid a decrease in the intensity of the reaction makes it possible to draw conclusions with regard to the prognosis. In doubtful cases, however, the test is not absolutely reliable.

Concurrence of Cirrhosis of Liver and Gynecomastia.—Paula states that, in seven cases of cirrhosis of the liver observed over a period of eight months, gynecomastia was noted five times. His object in reporting the cases is to call attention to the frequent concurrence of the two conditions, because if subsequent investigations disclose changes in the mammary glands in a high percentage of cases of cirrhosis they might lead to important conclusions with regard to either cirrhosis of the liver or gynecomastia.

Deutsche medizinische Wochenschrift, Berlin

56: 2031-2074 (Nov. 28) 1930

*Fatalities Following Blood Transfusions. H. Wildegans.—p. 2031.
Influence of Wavelengths in Irradiation of Ergosterol. E. Kisch and T. Reiter.—p. 2034.
Cerebral Focal Manifestations in Diabetic Coma. E. Kestermann.—p. 2036.
Ankylopoietic Spondylitis in Brothers. A. J. Weil and B. Allolio.—p. 2038.
"Avertin" Anesthesia in Pulmonary Tuberculosis. H. Kleesattel.—p. 2040.
Ovarian Hormone Therapy. H. Wiesbader.—p. 2043.

Fatalities Following Blood Transfusions.—Wildegans points out that, owing to the great confidence in the reliability of the blood group tests, the number of blood transfusions has greatly increased in recent years. However, in spite of blood group tests, fatalities following blood transfusions are more frequent than is commonly believed. A critical consideration

of the causes of the fatalities shows mistakes that are due to carelessness and that could be avoided, and also those that cannot be foreseen. To the first type of errors belong misunderstandings such as exchanging donors in the event that several transfusions are made at the same time. Fatalities due to errors in the blood group tests can be avoided if a control test is made immediately preceding the transfusion. In order to avoid mistakes in blood group tests, which are caused by deteriorated agglutinating serums, it is advisable to subject these serums to control tests. Before every transfusion the serum of the recipient should be mixed with the erythrocytes of the donor. Occasionally errors in the blood group determination may be due to abnormalities in the blood group. A complication may also be caused when the blood of the donor is not sufficiently diluted in the recipient; this is the case in patients in whom the quantity of blood has been greatly reduced. The total amount of the circulating blood should always be estimated before the transfusion is begun, and not more than one sixth or one fifth of the total quantity of blood should be transfused at one time. Mass transfusions from several donors are likewise not advisable, unless injections with blood diluting fluids have preceded. Endangered by blood from so-called universal donors are such persons in whom the blood-forming apparatus is not functioning properly. To detect auto-agglutination, which frequently exists in hemolytic icterus, pneumonia, anemia, cachexia and syphilis, the serum should be mixed with a drop of fresh blood. The phenomenon of panagglutination, which occurs in bacteremia and in chronic suppurations, may likewise prevent a correct determination of blood groups. Death after transfusion is mainly due to the fact that the elimination of the foreign substances overtaxes certain organs, such as the kidneys, liver, heart and vessels, and causes insufficiency. The danger of thrombosis or of embolism following transfusion is not great, provided the technic is faultless. In some cases it was found that death was caused by dilatation of the heart. Transfusion fatalities are more frequent in diseases of the blood and during sepsis than in acute hemorrhages. In spite of careful examinations, it has happened that malaria and syphilis have been transmitted by blood transfusions. Danger of anaphylaxis exists if, in case repeated transfusions are necessary, the same donor is chosen. To avoid this, a new donor of the same blood group should supply the blood. Still under discussion is the relation between agglutination and hemolysis. If hemolysis may take place without a preceding agglutination, then it would be necessary that in the preliminary tests more attention is given to hemolysis than has previously been done.

Klinische Wochenschrift, Berlin

9: 2185-2232 (Nov. 22) 1930

Physiologic and Pathologic Significance of Thymolymphatic System. E. Moro.—p. 2185.
Specific Dynamic Action of Various Types of Protein. F. Kerti.—p. 2189.
Parasystole Caused by Simple Interference and with Transition into Bigeminy. D. Scherf and A. Schott.—p. 2191.
Are Pfeiffer's Glandular Fever and Glandular Fever Identical? W. Schultz.—p. 2193.
*Artificial Pneumothorax in Treatment of Pneumonia in Infants. J. Duken.—p. 2195.
*Pneumothorax Therapy of Pneumonia in Infants. J. Jahr and R. Neumann.—p. 2200.
Artificial and Spontaneous Hypoglycemia. A. Oppenheimer.—p. 2202.
*Reflexes of Sinus Caroticus During Epilepsy. G. Marinesco and A. Kreindler.—p. 2204.
Reaction of Pregnant Uterus to Thermic Stimulation. H. Runge and H. Hartmann.—p. 2205.
Action of Mersalyl in Rectal Application. H. Natanson.—p. 2207.
Lipoid Cell in Xanthomatosis of Dura Mater and of Bones of Skull. E. Schliephake.—p. 2207.

Artificial Pneumothorax in Treatment of Pneumonia in Infants.—In an infant, aged 10 months, with pneumonia in the right upper lobe, an interlobar exudate developed. Duken performed an interlobar puncture, and a pneumothorax developed. After that, the child's condition improved rapidly. This unexpected therapeutic effect induced the author to employ the pneumothorax in similar cases. He gives several case reports, and thinks that in some instances the therapeutic effect of the pneumothorax was due to the fact that the lung was put to rest; in other cases, however, the good results were due to the changes in the intrathoracic pressure which influence the blood supply. The increased pressure on the side of the pneumothorax has the effect that more blood enters the healthy lung, and the increased activity of this lung compensates for the insufficiency of the diseased lung, and thus cyanosis is prevented. The author's experiences with pneumothorax therapy of pneumonia in infants and children are limited to eight cases, in which he used this form of treatment in the course of three years. This small number indicates that, in spite of the favorable effects obtained with this treatment, it was employed with great discrimination. In most cases of pneumonia in infants the usual conservative methods are effective. Artificial pneumothorax is advisable in cases of unilateral pneumonia with or without interlobar exudation, which take a protracted course, and which involve the danger of bronchiectasis. It might also be resorted to in order to counteract cyanosis. However, pneumothorax is contraindicated if a unilateral pneumonia of the lower lobes is complicated by a diffuse bronchitis of the other side of the lung. Another contraindication is the presence of thick, suppurative sputum, or of large quantities of sputum, because in such instances it is probable that the disturbance involves other conditions besides the pneumonia, and in such cases diathermy has given favorable results.

Pneumothorax Therapy of Pneumonia in Infants.—Jahr and Neumann employed artificial pneumothorax in five infants with pulmonary diseases. The authors agree with Duken and other investigators that in some cases this method has therapeutic value. Artificial pneumothorax is indicated in cases of pneumonia with a protracted course, and also when pneumonia is complicated with interlobar pleurisy or with mediastinal pleurisy.

Reflexes of Sinus Caroticus During Epilepsy.—Marinesco and Kreindler point out that it is generally accepted that an epileptic seizure is related to disturbances in the cerebral circulation. Because the sinus caroticus governs the blood supply of the brain, the authors studied the reflexes of the sinus caroticus on twenty-six epileptic patients, by graphically recording the pulse, respiration and the blood pressure, while pressure was exerted on the sinus. To determine the vasodepressor action of the sinus pressure test, plethysmography was employed. On the basis of their observations the authors reach the following conclusions: 1. The reflexes of the sinus caroticus are reduced in epileptic persons. 2. The vasomotor nerves and the blood pressure show a high degree of instability during epilepsy. 3. In some patients, especially in epileptic persons, pressure on the sinus may lead to typical convulsive attacks. From this it may be deduced that the sinus caroticus is of great significance in the mechanism of an epileptic seizure.

Medizinische Klinik, Berlin

26: 1735-1772 (Nov. 21) 1930. Partial Index

Clinical Aspects of Hypertension. H. Strauss.—p. 1735.
*Treatment and Prophylaxis of Whooping Cough by Means of Vaccine. W. Kaupe.—p. 1740.
Toxin for Schick Test. N. Kovács.—p. 1742.
Combined Isamine Blue and Ray Therapy of Malignant Tumors. H. Bernhardt.—p. 1743.
Gastrocardiac Syndrome. W. Kuckuk.—p. 1748.
Experiences with Quinidine Therapy in Perpetual Arrhythmia. Bülte and Reinwein.—p. 1751.
Tearing of M. Biceps Brachii. H. Sieben.—p. 1752.
Simple Colorimetric Determination of Uric Acid. W. and W. Zörkendörfer.—p. 1753.
Scurvy in Rats. W. Kollath.—p. 1754.

Treatment and Prophylaxis of Whooping Cough by Means of Vaccine.—Kaupe reports his experiences with a whooping cough vaccine in an institution for children and nurslings. The preparation that he employed is a vaccine, which is injected in increasing concentrations. The number 1 ampules contain 2,000 million of *Bacillus hemophilus-pertussis*, the number 2 ampules contain 4,000 million, the number 3 ampules contain 6,000 million, and the number 4 ampules contain 8,000 million. The injections are made intragluteally at intervals of from three to four days. In the children's department, eight of ten children contracted whooping cough. The vaccine treatment had the effect that the sick children improved rapidly, so that they were practically cured from ten to twelve days after the first injection. The two other children remained healthy. Of the fifteen nurslings, who likewise received the vaccine, two developed a mild form of whooping cough, and the others either remained entirely free from it or the infection was so slight that

it was hardly noticeable. The injections were almost painless and did not cause complications such as anaphylactic shock. Even those of the infants and children who developed a slight fever had always a good appetite and were not irritable. The author emphasizes that his experiences with the vaccine are limited to cases in which the whooping cough was in the beginning stage or had not yet begun. He does not know whether the vaccine therapy will have the same favorable effects in a more advanced stage of the disease. However, he recommends its use during the early stage and also for the protection of children who are exposed to whooping cough infection.

26: 1773-1808 (Nov. 28) 1930

Clinical Aspects and Therapy of Influenza During Childhood. E. Müller.—p. 1773.
Idiopathic Glycemia. O. Roth.—p. 1777.
Physiologic Areas of Dulness at Apexes of Lungs. A. Winkler.—p. 1780.
Problem of Traumatic Diabetes Following Injuries of Central Nervous System. J. Woll.—p. 1781.
Acute Appendicitis in Situs Viscerum Inversus Totalis. F. Mittelbach, Jr.—p. 1784.
*Rupture of Uterus Following Incorrect Dosage of Hypophyseal Preparations. A. von Probstner.—p. 1785.
Anosmia and Influenza. M. Bednár.—p. 1787.
Localized Scleroderma with Unilateral Atrophy of Tissues in Extremities. Fillié.—p. 1789.
Relation Between Cancer and Hypophysis. D. Engel.—p. 1790.
Behavior of Capillaries in Patients with Arthritis. A. J. Weil.—p. 1791.

Rupture of Uterus Following Incorrect Dosage of Hypophyseal Preparations.—Von Probstner describes five cases of rupture of the uterus caused by incorrect administration of the preparation of the posterior lobe of the hypophysis. Only one of the patients recovered. In this case the rupture had been incomplete. It is emphasized that the ruptures were not caused by the preparation as such but rather by the incorrect administration: by giving too large doses, by too frequent administrations or because the preparation was administered at the wrong time or in cases in which it was contraindicated, such as in abnormal presentations of the fetus and in disproportion between the fetal head and the maternal pelvis. The hypophyseal preparations exert the stronger influence the more susceptible the uterus and the farther advanced the process of delivery; namely, during the period of expulsion. They should therefore be employed only during this period. Because the uterine contractions that are produced by the administration of hypophyseal preparations have in the beginning a spasmlike character, they may endanger the life of the fetus. Later they usually become normal, but occasionally the spasmodic labor pains persist and, in order to prevent asphyxia of the fetus, the birth has to be completed quickly. However, during the period of dilatation this is not possible without endangering the life of the mother. In regard to the administration of hypophyseal preparations during the period of after-birth, it is stated that some authors have recommended them for every case, in order to hasten the expulsion of the placenta. The author, however warns against this. He emphasizes that the normal uterine contractions should not be interfered with even if, as the result of overexertion, short intermission set in. The contraction of the uterus should not be accelerated without absolute necessity because this would effect what really should be avoided; namely, atony. Hypophyseal preparations are contraindicated in cardiac and in renal diseases; also in eclampsia and in disproportion between the fetal head and the maternal pelvis. In the conclusion it is pointed out that, if the hypophyseal preparation has been administered, the physician has to remain with the patient until the action of the ecbolic is completed.

Münchener medizinische Wochenschrift, Munich

77: 1999-2046 (Nov. 21) 1930

Cessation of Life Innervation. L. R. Müller.—p. 1999.
*Is There a Thrombasthenia? P. Morawitz and R. Jürgens.—p. 2001.
Atmospheric Modification of Cutaneous Capillaries. Bettmann.—p. 2003.
Sterilization of Injection Fluids and of Medicaments. E. Leschke.—p. 2006.
Calmette's Pyrrhus Victory. H. Much.—p. 2008.
Foundations of Modern Surgery of Brain. M. Ernst.—p. 2012.
*Voluntary Modification of Sex in Man. H. Füth.—p. 2014.
Favus in South Bavaria. H. O. Münsterer.—p. 2015.

Is There a Thrombasthenia?—Morawitz and Jürgens state that the term thrombasthenia was introduced by Glanzmann, who applies it to a functional deficiency of the blood plates when they are present in a normal or an almost normal number. However, other investigators have proved that the coagulation of the blood is dependent not only on the presence and the proper function of the blood plates but also on the condition of the vessels, especially the vascular endothelium. A definite demonstration, whether a deficient agglutination capacity of the plates is possible when their number is normal, can be made only if the variable vascular factor can be excluded. Up to now, there was no reliable method to accomplish this. However, the authors constructed a special apparatus, a so-called capillar-thrombometer by which it is possible to determine the thrombosis time extravascularly and independently of vascular factors. In a case of a peculiar hemorrhagic diathesis, a sort of pseudo-hemophilia, it could be shown that true thrombasthenia does occur. It becomes manifest in a deficient agglutination capacity of plates that morphologically and numerically are normal. By demonstrating the abnormally prolonged thrombosis time in the capillary thrombometer, the proof was given that this phenomenon may develop without involvement of the blood vessels.

Voluntary Modification of Sex in Man.—Füth calls attention to Unterberger's article on the voluntary modification of sex in man, which was reported in the *Deutsche medizinische Wochenschrift* (**56**:304 [Feb. 21] 1930; abstr. THE JOURNAL, May 3, 1930, p. 1451). He also cites others who studied this problem. Bluhm expresses the opinion that Unterberger's results are not accidental, and points out that in 1924 she already had called attention to the sex-determining action of the vaginal secretion. Then Füth reports his own investigations. In order to determine whether the reaction of the vaginal secretion influences the sex of the child, the vaginal secretions of 253 pregnant women were examined. It was found that among those with a strong acid reaction of the vaginal secretion the number of female births was largest, whereas among those with a slight acidity or with an almost amphoteric reaction the number of male births predominated. However, it was yet necessary to determine whether the reaction of the vaginal secretion is the same at the time of conception as during pregnancy. Control tests were made after confinement, and it was found that the reaction remains about the same. The larger number of male births in case of slight acidity or in an almost amphoteric reaction seems to corroborate Unterberger's theory. However, it must be admitted that objections such as accidental, limited number, and slight differences in the percentages cannot be entirely disregarded.

77: 2047-2094 (Nov. 28) 1930

Epidemiology of Weil's Disease with Especial Consideration of Water Infection. P. Uhlenhuth.—p. 2047. C'td.
*Congo Red as Hemostatic. T. Wedekind, J. Becker and B. Wienert.—p. 2049.
Upper Limit of "Normal Body Temperature." H. Zimmermann.—p. 2051.
Black Dermographism. Emdin.—p. 2055.
Diagnosis of Renal Diseases. L. Peritz.—p. 2056.
*Chronic Myeloid Leukemia and Pregnancy. Ridder.—p. 2057.
*Surgical Treatment of Ascites. F. Franke.—p. 2058.
*Phrenic Exeresis and Its Significance in Surgical Treatment of Pulmonary Tuberculosis. T. Naegeli and H. Schulte-Tigges.—p. 2061.
Therapeutic Applicability of Aconitum Napellus. H. F. von Kress.—p. 2062.
Hormonal Sterilization of Female Organism. L. Haberlandt.—p. 2064.

Congo Red as Hemostatic.—Following a discussion of the experimental foundations of the hemostatic action of congo red, Wedekind et al. give case reports that illustrate its efficacy in various forms of acute hemorrhages. Congo red was employed in fifty cases, namely, in hemorrhages during pulmonary tuberculosis and in bronchiectatic hemorrhages; also in menorrhagia, in excessive bleeding after the extraction of teeth and in various other hemorrhages. From 5 to 10 cc. of a 1 per cent sterile aqueous solution of congo red was administered intravenously. Secondary effects were never observed, even when the injection was repeated. It was found that the injection of the congo red solution effected an increase in the number of monocytes, which indicates a better functioning of the reticulo-endothelial system. The number of blood plates and the fibrinogen content were increased and the coagulation time was reduced. Congo red was especially effective in patients with abnormalities in the composition of the blood; in these instances it was superior to other hemostatics. However, in patients with a normal blood picture the result was not always satisfactory.

Chronic Myeloid Leukemia and Pregnancy.—Ridder states that a review of the literature convinced him that the beginning of a pregnancy and the maturing of a healthy child is extremely rare during myeloid leukemia. He then reports the clinical history of a woman, aged 34, who complained of palpitation of the heart, of steadily increasing weakness and of pain on the left side of the abdomen. Examination revealed a large tumor of the spleen and the characteristic blood picture of myeloid leukemia. Roentgen therapy was instituted and under its influence the splenic tumor decreased and the patient's general condition improved likewise. Several months later, however, she asked medical advice, because her abdomen was again becoming larger. It was now discovered that she was pregnant. Several months later she gave birth to a full-term, healthy, male child. After confinement the woman's condition became steadily worse, and two and one-half months later she died. The child developed normally, and an examination of the blood did not reveal abnormalities. The author points out that as far as can now be seen the frequent roentgen treatments have had no detrimental influence on the child.

Surgical Treatment of Ascites. — Franke criticizes Lepehne's pessimistic point of view in regard to the surgical treatment of ascites. Because Lepehne's unfavorable criticism might prevent many general practitioners from seeking surgical aid for a patient with ascites, the author stresses the therapeutic value of surgical treatment. He discusses the various operative methods; namely, Talma's operation and its modifications, permanent subcutaneous drainage, extirpation of the spleen as recommended by Mayo, and especially Ruotte's operation. He considers Ruotte's operation as the method of choice.

Phrenic Exeresis in Surgical Treatment of Pulmonary Tuberculosis.—Naegeli and Schulte-Tigges first review a former article in which they reported their observations on 100 patients who had undergone phrenic exeresis. They had found that, in 48 per cent of the patients with cavern formation, exeresis was followed by a disappearance of tubercle bacilli from the sputum. The most favorable results had been obtained in patients with secondary, round caverns, with a tendency for shrinking and in whom there were no adhesions and infiltrations in the surroundings of the cavern. Exeresis was most effective in the absence of pleuritic adhesions. Because some authorities had asserted that the permanent results of phrenic exeresis are not favorable, the authors subjected fifty-five patients, who from two to four years previously had undergone phrenic exeresis, to after-examinations. Seventeen of the patients were free from bacilli and were able to follow their occupation. In twenty-four patients, who had had large caverns with infiltrations in their surroundings, the results were likewise favorable in that the caverns were smaller and the patients were able to do light work. However, the sputum still contained bacilli. The other fourteen cases showed no improvement but rather exacerbations. The authors come to the conclusion that the selection of patients who are subjected to phrenic exeresis should be made with great care. The comparatively simple technic of this method should not be a temptation to perform it without carefully evaluating its advisability.

Wiener klinische Wochenschrift, Vienna

43: 1461-1492 (Nov. 27) 1930

*Therapy of Lupus Vulgaris: Gerson Diet. R. Volk.—p. 1461.
Treatment of Esophageal Strictures. H. Pirker.—p. 1467.
Determination of Total Carbohydrate Content and Demonstration of Glycogen. H. Popper and O. Wozasek.—p. 1471.
Irritative Conditions of Urinary Bladder Treated by Means of Theobromine Sodiosalicylate. F. Fuchs.—p. 1473.
New Apparatus for Determination of Coagulation Time. H. Homma.—p. 1474.
Foundations of Light Therapy. W. Hausmann.—p. 1475.
Therapy of Sciatica. H. Herschmann.—p. 1476.
Diagnosis by Means of Tuberculin. E. Helmreich.—p. 1479.

Therapy of Lupus Vulgaris: Gerson Diet.—Volk first discusses the main features of Gerson's diet. It is based on the observation that a diet which effects acidity promotes the healing of infectious processes, whereas a more basic diet retards the healing. The main characteristics of the diet are (1) deficiency in the sodium chloride content, (2) large quantities of fresh vegetables, and (3) changes in the proportions of proteins, fats and carbohydrates. Compared with Voit's formula, which prescribes for a healthy worker 118 Gm. of protein, 56 Gm. of fat and 500 Gm. of carbohydrates, the diet for tuberculous patients prescribes about 90 Gm. of protein, 162 Gm. of fat and only 222 Gm. of carbohydrates. This shows a considerable increase in the quantity of fat, whereas the carbohydrates are reduced to less than half. It has been proved in animal experiments that, if the food contains excessive quantities of carbohydrates, the susceptibility to tuberculosis is heightened, whereas a diet with large amounts of fats reduces the susceptibility to tuberculous infection. The author further stresses the great significance of the vitamins. In discussing the therapeutic value of the dietary treatment he states that it gives the best results in tuberculosis of bones and of joints and particularly in lupus vulgaris. Tuberculosis of the mucous membranes was also favorably influenced. In regard to pulmonary tuberculosis the author states that his observations coincide with those reported by Sauerbruch; namely, that many patients, who were in a hopeless condition, improved to such an extent that they could be treated surgically. In the conclusion it is emphasized that, although the Gerson dietary treatment cannot be considered a panacea for all cases of tuberculosis, it is nevertheless a valuable therapeutic aid.

Zeitschrift für Tuberkulose, Leipzig

58: 385-466 (Nov.) 1930

Artificial Pneumothorax: Development of Infiltrations in Opposite Lung. H. Fechter.—p. 385.
Tuberculous Caverns of Lung: Spontaneous Healing. A. J. Katzmann.—p. 393.
*Filtrable Elements of Tuberculosis Virus. A. Calmette and J. Valtis.—p. 402.
Tuberculosis in German Students. E. Saupe and Mahn.—p. 407.
Gold Treatment of Tuberculosis. K. Henius.—p. 424.
Gerson's Dietary Treatment of Tuberculosis. H. Stein.—p. 426.
New Drugs and Food Preparations Used in Treatment of Tuberculosis. G. Schröder.—p. 431.

Filtrable Elements of Tuberculosis Virus: Prebacillary Granulemia.—In experiments on guinea-pigs, Calmette and Valtis demonstrated that subcutaneous or intraperitoneal injections of filtrates containing the ultravirus of tuberculosis, regardless of whether they were obtained from young cultures or from tuberculous organs, blood, urine, milk, exudates, pus lysates or sputum containing tubercle bacilli, frequently caused slight enlargement of the lymph nodes without the formation of nodules. In the enlarged lymph nodes a careful search from three to eight weeks after the injection revealed typical tubercle bacilli and, in addition, acid-fast granules. About the acid-fast granules were numerous extremely fine, barely visible dustlike granules, some of which were spherical and some rod shaped. These granules were not acid fast. In many of the animals that died a few days or weeks following the injection of the filtrate, postmortem examination did not reveal macroscopic changes. A careful microscopic examination of the slightly enlarged lymph nodes, however, usually revealed a few bacilli. Occasionally the spleen was slightly enlarged and the lungs showed small localized areas of hepatization. When the sightly enlarged lymph nodes were ground up and injected into other guinea-pigs enlargement of their lymph nodes was produced, and if serial passages were made in this manner there developed after from six to eight passages typical tuberculous changes with nodules undergoing caseous degeneration. Inoculations made from the nodules produced typical tuberculosis. It was also demonstrated that the invisible and virulent elements in the filtrates, when injected intraperitoneally in pregnant guinea-pigs, caused pathologic changes in the fetuses. Young animals infected in this manner did not develop the characteristic changes in the organs noted following the injection of guinea-pigs with tubercle bacilli but seemed to have a severe intoxication. Some groups of lymph nodes were greatly swollen and in them were typical acid-fast bacilli. By means of serial inoculations of guinea-pigs with the bacilli, their characteristics could be made to approach the characteristics of typical tubercle bacilli until finally they could not be differentiated from tubercle bacilli cultivated from tuberculous organs. To substantiate this experimental observation clinically the authors examined post mortem twenty-six fetuses and children of tuberculous mothers. The microscopic examination showed in 80 per cent of the cases that

a transplacental infection with filtrable elements had occurred. It was noted that if this infection occurs in from the third to the sixth month of pregnancy the child frequently dies during intra-uterine life or during the first weeks after birth. If it occurs in a later period of pregnancy the infection is usually nonvirulent and may disappear completely; it rarely causes tuberculous changes and may even produce a transient resistance to virulent infections. These observations show that the child of a tuberculous mother frequently contains the virus of tuberculosis at birth and that from the virus true tubercle bacilli may develop. Even when they do not, the virus itself produces an intoxication that may terminate fatally during the first few weeks of life. This explains why the new-born infants of tuberculous mothers die so frequently and why it is impossible to demonstrate the slightest change in their organs. Those, however, who are infected with the ultravirus shortly before birth and survive the infection contain a few bacilli of low virulence or benign tuberculous changes, which give them a resistance to later infections. Emphasis is laid on the fact that the observations mentioned necessitate a revision of the views held until now with regard to the mode of origin of tuberculous infection. The disease called tuberculosis and characterized by the presence of inoculable giant cells containing bacilli and of tubercles in various organs is only the chronic form or the end-stage of an infection caused by an ultravirus whose elements are at first invisible but gradually become nonacid-fast, dustlike bodies and later develop into acid-fast granules and finally into tubercle bacilli. A large number of serous effusions in the pleural, pericardial and peritoneal cavities and in the meninges and joints appear to be caused by the ultravirus exclusively, as do also various skin diseases (erythema nodosum, sarcoid, papulonecrotic tuberculid and so on), various septicemias (typhobacillosis), and granulemia, in which it is extremely difficult to find acid-fast tubercle bacilli. The recommendation is made that all these pathologic conditions in which the ultravirus of tuberculosis seems to be the main cause and in most of which the prognosis is good be differentiated from true bacillosis and be designated as "prebacillary granulemia."

Zentralblatt für Gynäkologie, Leipzig

54: 2881-2944 (Nov. 15) 1930

Operative Treatment of Rectovaginal Fistula. H. Füth.—p. 2882.
Relations Between Anterior Lobe of Hypophysis and Ovary: Hormonal Sterilization. A. Mahnert.—p. 2883.
*Chorio-Epithelioma with Rare Clinical Symptoms. D. von Raisz.—p. 2887.
*Fasting Cures in Hyperemesis Gravidarum. H. Offergeld.—p. 2892.
Etiology and Prophylaxis of Uterine Myoma. N. Kakuschkin.—p. 2899.
Congenital, Isolated Fissure of Cervix Uteri and of Portio Vaginalis. I. Benzion.—p. 2909.
Temporary Degeneration of Myoma During Pregnancy. C. Fervers.—p. 2911.

Chorio-Epithelioma with Rare Clinical Symptoms.—According to von Raisz, the recognition of a chorio-epithelioma is, in most instances, not difficult, especially when a hydatid mole pregnancy has preceded. In the case reported, however, the clinical symptoms differed from those that are usually observed. The author describes the clinical history of the case. He thinks there can be no doubt that the chorio-epithelioma was the sequela of the hydatid mole of five years previous. The amenorrhea was probably the result of the repeated curettage, by which the entire mucous membrane had been destroyed. Examination of the scrapings removed during curettage gave no indications for an existing chorio-epithelioma. The chorio-epithelioma had originated in an intramural focus, and this is why fragments of the chorio-epithelioma were not found in the material removed by curettage, and this also explains why hemorrhages, which are usually the main characteristic of chorio-epithelioma, were absent. Because cases without hemorrhage are extremely rare, the disorder was not recognized as chorio-epithelioma. The operation revealed that the destructive growth in the uterine wall had spread to the bladder and to the parietal peritoneum. The patient died thirty-one days after the operation. The hemorrhages, which had not been external, had been internal, between the tissues and into the abdominal cavity, in accordance with the direction of the growth. In the conclusion, the author stresses the value of the Zondek-Aschheim reaction. He thinks that, if this test had been made following the hydatid mole pregnancy, the chorio-epithelioma would have been detected earlier.

Fasting Cures in Hyperemesis Gravidarum.—Offergeld asserts that hyperemesis gravidarum is mainly due to incretory disturbances and to an increased irritability of the sympathetic nervous system. Accordingly, he advises hormone therapy. He recommends hormones of the ovaries and of corpus luteum. Whether thyroidal hormone and also small amounts of the suprarenal hormone are advisable depends on the individual case, and occasionally extracts of other organs might be helpful. Because fasting often counteracts vomiting, it might also prove helpful in hyperemesis gravidarum. A prolonged fasting cure might be injurious to a pregnant organism, but a shorter fast of one or two days can be safely employed. The author found it helpful in addition to the hormonal substitution therapy; however, he gave about 1.5 liters of fluids. If during this time favorable results are not obtained it is useless to prolong the fasting cure. Besides the complete fast the author recommends a changed diet. A diet rich in proteins should be abandoned in favor of a fruit and vegetable diet. The author thinks that hyperemesis could be avoided in many instances if, during the beginning of pregnancy, a diet too rich in proteins and fats is avoided, and instead a more vegetarian diet is adopted.

Bibliotek for Læger, Copenhagen

122: 471-519 (Oct.) 1930

Great Omentum: Function and Rôle in Diagnosis and Treatment of Acute Abdominal Conditions. I. Collin and J. Seedorff.—p. 471.
*Sedimentation Reaction in Patients with Cancer. S. A. Holbøll.—p. 497.

Sedimentation Reaction in Patients with Cancer.—Tests of the sedimentation reaction made by Holbøll in 190 patients with cancer or sarcoma showed a pathologically increased sedimentation reaction in most cases; in some instances the reaction was normal. The increased reaction was parallel with unfavorable clinical manifestations such as anemia, rise in temperature, and development of metastases. The significance of the sedimentation reaction in the diagnosis and prognosis in cancer is discussed.

Hygiea, Stockholm

92: 801-832 (Nov. 15) 1930

*Dystonia of Mucous Membrane of Upper Air Passages. I. Syk.—p. 808.
*Case of Tumor of Spinal Cord with Unusual Results on Lumbar Puncture. A. Grönberg.—p. 819.

Dystonia of Mucous Membrane of Upper Air Passages.—For the "catarrhs" that yield to one or two applications of an astringent, Syk suggests the term "dystonia of the mucous membrane" and thinks that this designation should clinically maintain its place beside chronic catarrh and purely nervous hypersensibility of the mucous membrane.

Tumor of Spinal Cord with Unusual Results on Lumbar Puncture.—Grönberg believes that in his case with typical picture of caudal tumor the lumbar needle punctured the cystic tumor. Quenckenstedt's sign was negative. The contents of the tumor gave bilirubin reactions.

Ugeskrift for Læger, Copenhagen

92: 1059-1078 (Nov. 13) 1930

*Fascial Transplantation in Postoperative Ventral Hernia. S. Harild.—p. 1059.
*Case of Rectal Hemorrhage from Lesion Due to Thermometer. S. A. Holbøll.—p. 1062.

Fascial Transplantation in Postoperative Ventral Hernia.—Harild reports five cases of postoperative ventral hernia with transplantation of fascia according to Kirschner. The cases have been observed for from one to five years. There has been no recurrence. Another operative method applied in twenty-seven less grave cases has been followed by recurrence in five cases.

Rectal Hemorrhage from Lesion Due to Thermometer.—In Holbøll's case in a man who had recently been given intense antisyphilitic treatment, jaundice developed and was followed by rectal hemorrhage. There was a pronounced anemia. Proctoscopy revealed a deep bleeding longitudinal wound 2 or 3 cm. long on the anterior wall of the rectum about 4 cm. above the anal opening. The anemia was due to the rectal bleeding from this lesion, caused by a thermometer.